

Biomolecules

Question1

Identify a side chain (R) group present in Leucine, an amino acid.

MHT CET 2025 5th May Evening Shift

Options:

A.

H-

B.

-CH₃

C.

Me₂CH-

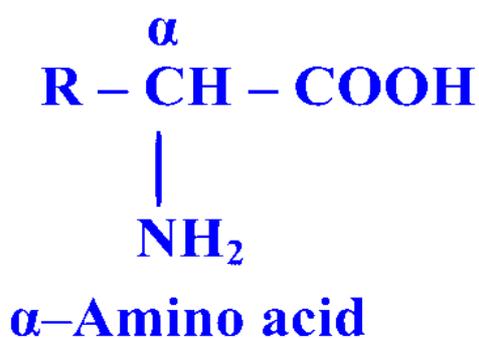
D.

Me₂CH - CH₂-

Answer: D

Solution:

General representation of α -amino acids: where, 'R' in the structure of α -amino acids represents side chain and may contain additional functional groups.



Side chain (-R)	Amino acid
H-	Glycine
-CH ₃	Alanine
Me ₂ CH-	Valine
Me ₂ CH - CH ₂ -	Leucine

Question2

Which from following carbohydrates produces glucose, galactose and fructose on hydrolysis?

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Options:

A.

Maltose

B.

Stachyose

C.

Raffinose

D.

Lactose

Answer: C



Solution:

Carbohydrate	Hydrolysis products
Maltose	two glucose units
Raffinose	one unit each of glucose, fructose and galactose
Stachyose	One glucose unit + one fructose unit + two galactose units
Lactose	one glucose unit + one galactose unit

If we do not consider stoichiometry then both the options (B) and (C) can be the correct answers.

Question3

Identify the carbon atom numbered from C'_1 to C'_5 of monosaccharide unit of DNA nucleotide that lacks oxygen atom from -OH group.

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Options:

A.

C'_1

B.

C'_2 .

C.

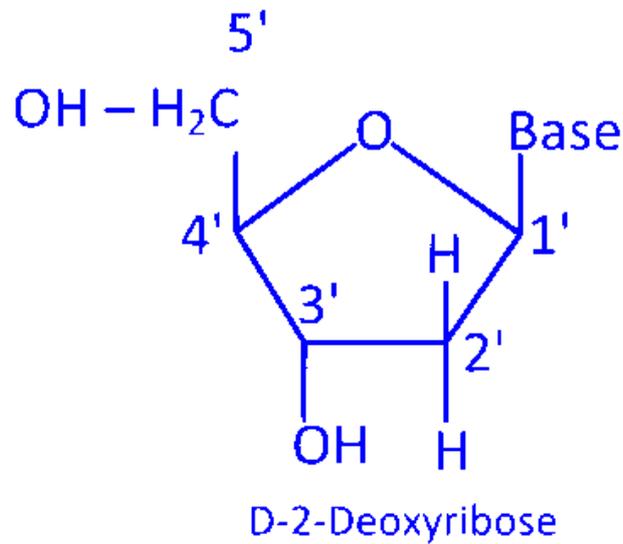
C'_3

D.

C₄'

Answer: B

Solution:



Question4

Identify acidic amino acid from following list represented by three letter symbols.

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Options:

A.

Arg

B.

Lys

C.

Met

D.

Asp

Answer: D

Solution:

Three letter symbols	Name	Type of amino acids
Arg	Arginine	Basic
Lys	Lysine	Basic
Met	Methionine	Neutral
Asp	Aspartic acid	Acidic

Question5

Identify neutral aminoacid from following list represented by three letter symbols.

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Options:

A. Arg

B. Asp

C. Leu

D. His

Answer: C

Solution:

Three letter symbols	Amino acid	Nature
Arg	Arginine	Basic
Asp	Aspartic acid	Acidic
Leu	Leucine	Neutral
His	Histidine	Basic

Question6

What are the positions of ' N ' atoms present in purine ring of nucleic acids?

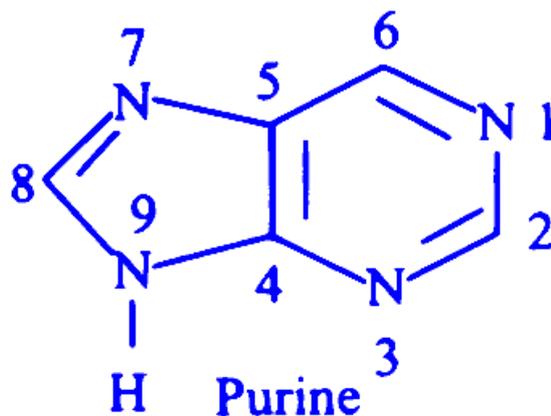
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Options:

- A. 1,3 and 5
- B. 1,3 and 9
- C. 1,5,7 and 9
- D. 1,3,7 and 9

Answer: D

Solution:



Question7

What type of glycosidic linkages are present in amylose?

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Options:

- A. $\alpha - 1, 4$
- B. $\alpha - 1, 6$
- C. $\alpha - 1, 4$ and $\alpha - 1, 6$
- D. $\beta - 1, 4$ and $\alpha - 1, 6$

Answer: A

Solution:

Amylose is a polysaccharide component of starch.

It is a linear polymer of **D-glucose** units linked primarily by **α -1,4 glycosidic bonds**.

The branching (with α -1,6 linkages) occurs in **amylopectin**, not amylose.

Correct Answer:

Option A: α -1,4

Question8

What is the total number of carbon atoms present in a sugar molecule of RNA nucleotide?



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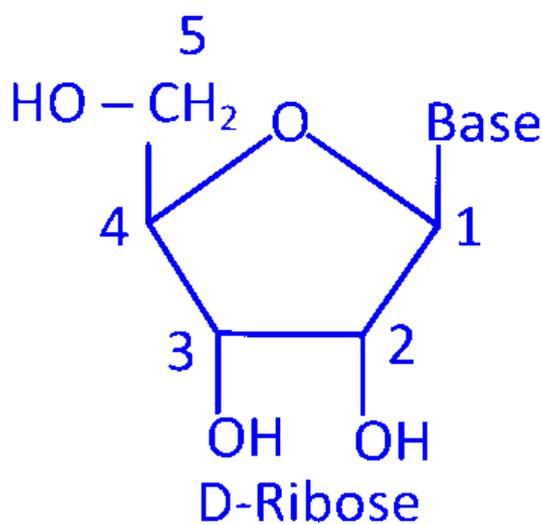
Options:

- A. 6
- B. 5
- C. 4
- D. 12

Answer: B

Solution:

In RNA, the sugar component of nucleotide unit D-ribose has 5 carbon atoms.



Question9

Identify source of Eugenol from following.

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Options:

- A. Clove
- B. Indian gooseberry
- C. Wintergreen
- D. Citrus fruits

Answer: A

Solution:

The main natural source of **Eugenol** is **Clove**.

Correct Answer: Option A - Clove

Question10

Which from following is NOT a globular protein?

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Options:

- A. Legumelin
- B. Egg albumin
- C. Myosin
- D. Insulin

Answer: C

Solution:

Myosin is a fibrous protein while the rest are globular proteins.

Question11

Identify glycosidic linkage in maltose.

MHT CET 2025 25th April Morning Shift

Options:

- A. $\alpha - 1, 4$
- B. $\alpha - 1, 6$
- C. $\alpha - 2, 4$
- D. $\beta - 1, 4$

Answer: A

Solution:

Maltose is a **disaccharide** consisting of two molecules of **D-glucose** linked together. The linkage is formed between the **α -anomeric carbon (C1) of one glucose** and the **C4 hydroxyl group of the other glucose**.

This bond is specifically called an **α -(1→4) glycosidic linkage**.

Correct Answer: Option A — α -1,4

Question12

Identify acidic amino acid from following list represented by three letter symbols.



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Options:

- A. Thr
- B. Trp
- C. His
- D. Glu

Answer: D

Solution:

Threonine (Thr) and Tryptophan (Trp) are neutral amino acids. Histidine (His) is a basic amino acid whereas Glutamic acid (Glu) is an acidic amino acid.

Question13

Find the number of moles of glycerol produced when n mole of triglyceride undergoes saponification.

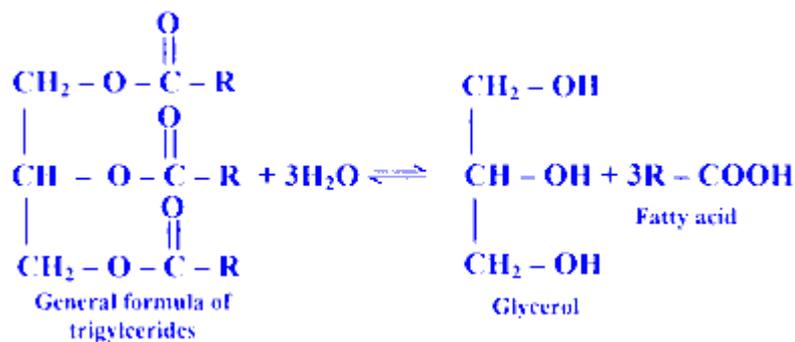
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Options:

- A. n
- B. $2n$
- C. $3n$
- D. $\frac{3}{2}n$

Answer: A

Solution:



Question14

What is the total number of -OH groups present in ribonucleoside?

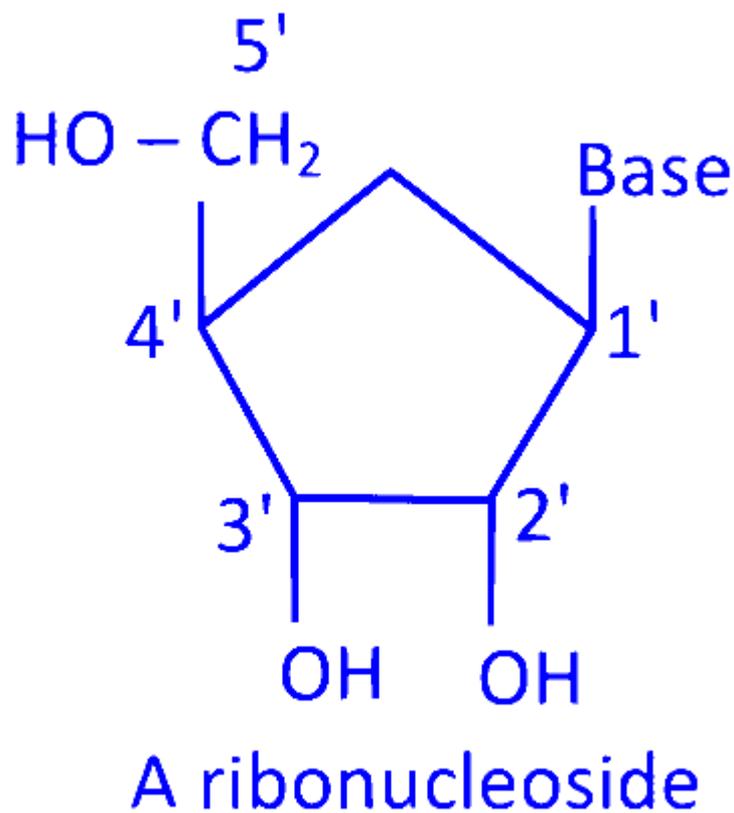
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Options:

- A. 5
- B. 4
- C. 3
- D. 2

Answer: C

Solution:



Question15

What type of glycosidic linkages are present in cellulose?

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Options:

- A. $\alpha - 1, 4$
- B. $\beta - 1, 4$
- C. $\alpha - 1, 6$
- D. $\beta - 1, 6$

Answer: B

Solution:

In **cellulose**, the glucose monomers are linked by **β -1,4 glycosidic bonds**. This linkage causes each successive glucose unit to be rotated 180° , producing long, straight chains that form strong fibrils through hydrogen bonding.

✔ Correct Answer: **Option B: β -1,4**

Question16

Which amino acid from following contains $-\text{CH}_3$ as side chain?

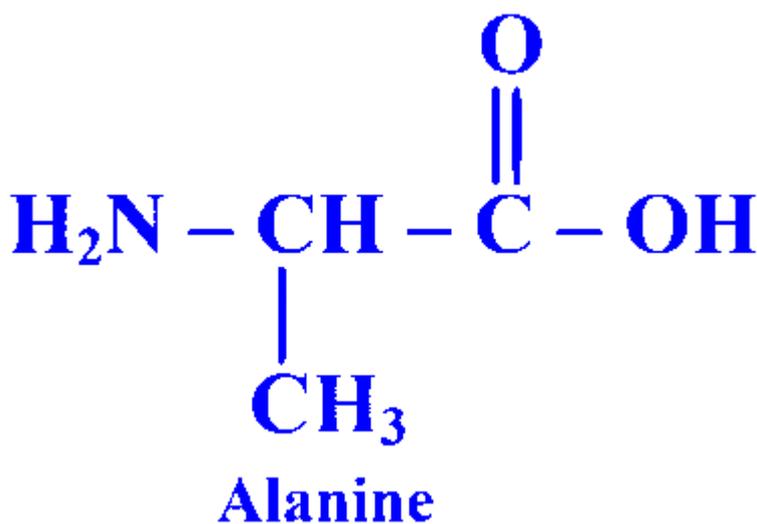
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Options:

- A. Leucine
- B. Alanine
- C. Serine
- D. Valine

Answer: B

Solution:



Question17

Which carbon atoms of $\alpha - D$ glucose and $\beta - D$ fructose respectively forms glycosidic linkage in sucrose?

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Options:

- A. C – 1 and C – 2
- B. C-2 and C-1
- C. C-2 and C-6
- D. C-1 and C-5

Answer: A

Solution:

Structure of sucrose contains glycosidic linkage between C – 1 of $\alpha - D$ -glucose and C – 2 of β -D-fructose. Aldehyde and ketone groups of both the monosaccharide units are involved in the formation of the glycosidic bond.

Question18

Which from following nitrogen bases either of purine or pyrimidine does NOT contain $-\text{NH}_2$ group attached with its ring?

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Options:

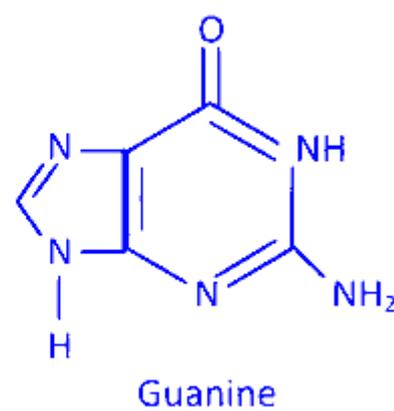
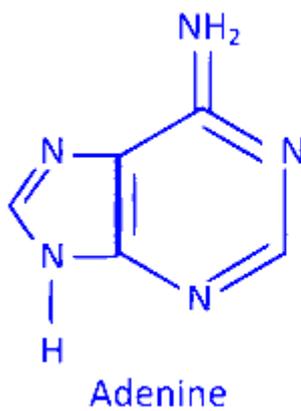
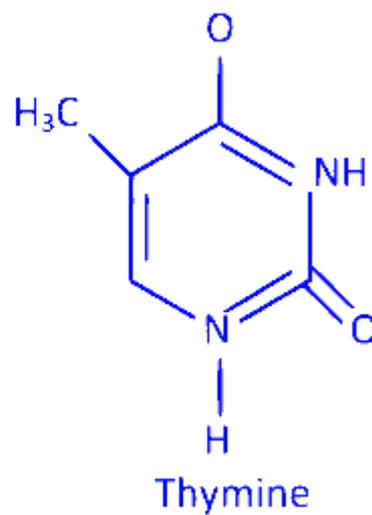
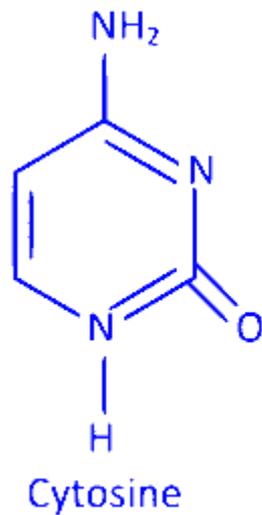
- A. Adenine
- B. Thymine

C. Guanine

D. Cytosine

Answer: C

Solution:



Question19

Which from following amino acids contains heterocyclic ring at a side chain (R) group?

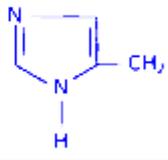
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Options:

- A. Threonine
- B. Histidine
- C. Cysteine
- D. Valine

Answer: C

Solution:

Name of amino acid	Side chain (-R)
Threonine	$\text{CH}_3 - \text{CHOH}$
Cysteine	$\text{HS} - \text{CH}_2 -$
Histidine	
Valine	Me_2CH

Question20

Identify the source of gallic acid from following

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Options:

- A. Clove
- B. Wintergreen
- C. Citrus fruits
- D. Indian gooseberry

Answer: D

Solution:

Gallic acid is a type of phenolic acid, naturally occurring in various plants. It is especially found in high amounts in **Indian gooseberry (Amla, *Phyllanthus emblica*)**, as well as in gallnuts and tea leaves.

✓ Correct Answer: **Option D — Indian gooseberry**

Question21

Which from following amino acids contains ' S ' in its side chain (R) ?

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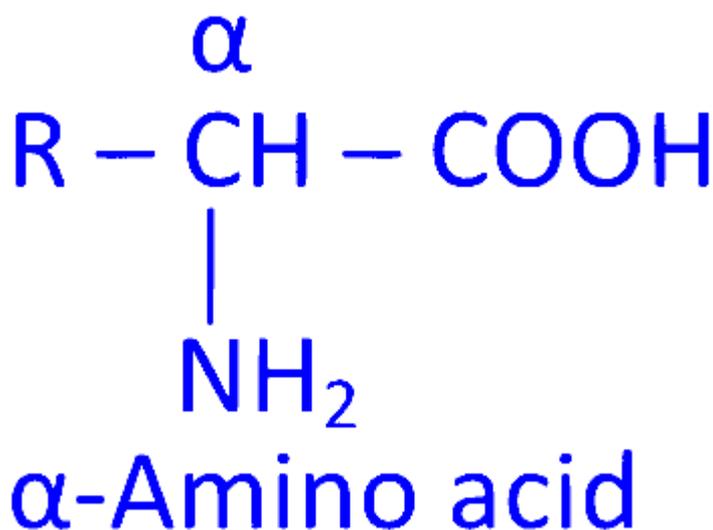
Options:

- A. Methionine
- B. Lysine
- C. Glutamic acid
- D. Glycine

Answer: A

Solution:

General representation of α - amino acids :



where, ' R ' in the structure of α -amino acids represents side chain and may contain additional functional groups.



Amino acid	Side chain (R-)
Methionine	Me – S – CH ₂ – CH ₂
Lysine	H ₂ N – (CH ₂) ₄ –
Glutamic acid	HOOC – CH ₂ – CH ₂ –
Glycine	H –

Question22

Which from following on hydrolysis forms invert sugar?

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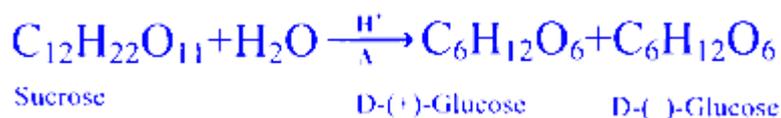
Options:

- A. Sucrose
- B. Maltose
- C. Starch
- D. Lactose

Answer: A

Solution:

Sucrose (C₁₂H₂₂O₁₁) is dextrorotatory (+66.5°). On hydrolysis with dilute acid or an enzyme called invertase, sucrose gives equimolar mixture of D- (+)-glucose and D- (-)-fructose.



∴ Laevorotation of fructose (−92.4°) is larger than the dextrorotation of glucose (+52.7°).

Hence, hydrolysis of sucrose is also called inversion of sucrose.

Question23



Which amino acid from following is NOT synthesized in our body?

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Options:

- A. Tyrosine
- B. Tryptophan
- C. Glutamine
- D. Glycine

Answer: B

Solution:

The correct answer is **Option B: Tryptophan**.

Explanation:

Amino acids are classified into two types:

1. **Essential amino acids:** These cannot be synthesized by our body, so they must be obtained from the diet.
2. **Non-essential amino acids:** These can be synthesized in our body.

Let's look at each option:

- **Tyrosine:** It is a non-essential amino acid; our body synthesizes it from phenylalanine.
- **Tryptophan:** It is an essential amino acid; our body cannot synthesize it, so it must be obtained from the diet.
- **Glutamine:** It is a non-essential amino acid; the body can synthesize it.
- **Glycine:** It is also a non-essential amino acid.

Therefore, the amino acid which is NOT synthesized in our body is **Tryptophan (Option B)**.

Question24

Which carbon atom of glucofuranose numbered from C – 1 to C – 6 is anomeric?



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Options:

A. C – 5

B. C – 6

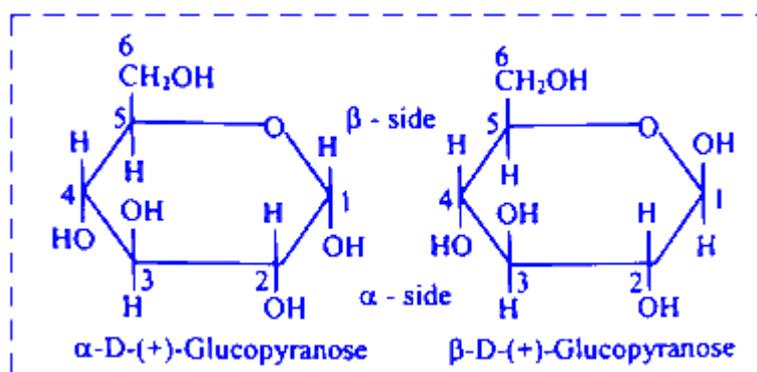
C. C – 2

D. C – 1

Answer: D

Solution:

In Haworth formula the lower side of the ring is called α -side and the upper side is the β -side. The α -anomer has its anomeric hydroxyl (-OH) group (at C -1) on the α -side, whereas the β -anomer has its anomeric hydroxyl (-OH) group (at C - 1) on the β -side.



Question25

What are the positions of ' N ' atoms present in pyrimidine ring of nucleic acids?

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Options:

A. 1 and 5



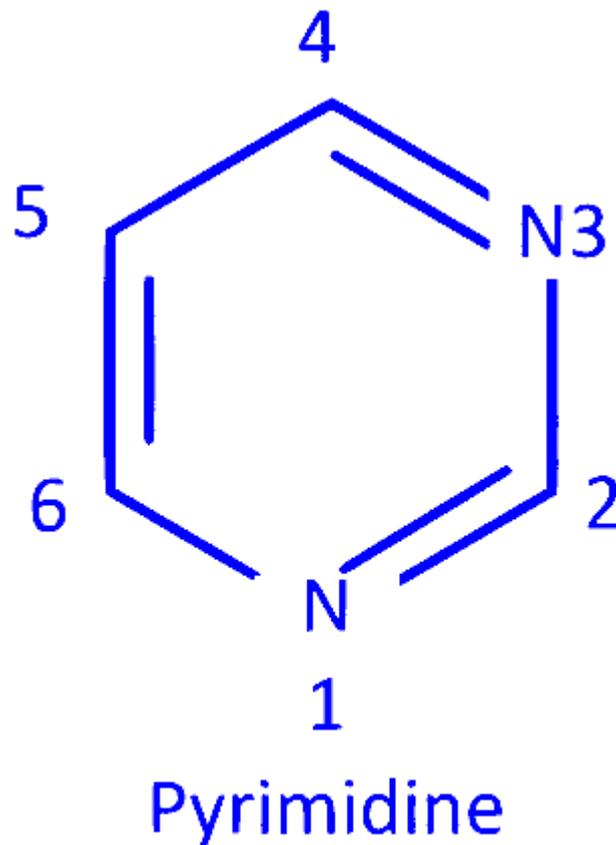
B. 1 and 3

C. 1,3 and 5

D. 3 and 5

Answer: B

Solution:



Question26

Identify neutral amino acid from following list represented by three letter symbols.

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Options:

A. Trp

B. Arg

C. Lys

D. Glu

Answer: A

Solution:

The table below shows the three-letter symbols for each amino acid, their full names, and their types:

Three letter symbols	Amino acid	Type of amino acid
Trp	Tryptophan	Neutral
Arg	Arginine	Basic
Lys	Lysine	Basic
Glu	Glutamic acid	Acidic

Among these options, “Trp” stands for Tryptophan, and it is labeled as Neutral.

Therefore, Tryptophan (Trp) is the neutral amino acid in the list.

Question27

Which from following tests confirms presence of aldehydic group in glucose?

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Options:

A. Formation of oxime when reacted with NH_2OH .

B. Formation of gluconic acid when reacted with Br_2 water.

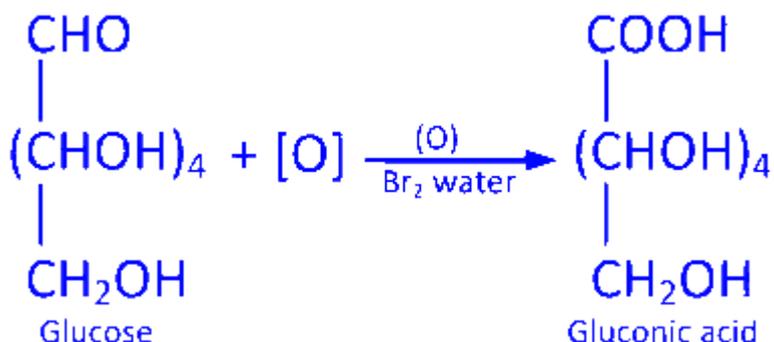
C. Formation of saccharic acid when glucose and gluconic acid treated with dil. HNO_3 .

D. Formation of penta acetate when treated with acetic anhydride.

Answer: B

Solution:

Formation of gluconic acid when reacted with bromine water confirms that carbonyl group in glucose is in the form of aldehyde.



Question28

Which from following is an essential amino acid?

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Options:

- A. Tyrosine
- B. Serine
- C. Histidine
- D. Glycine

Answer: C

Solution:

The correct answer is **Option C: Histidine**.

Explanation:

- **Essential amino acids** are those which cannot be synthesized by our body and must be obtained from the diet.

From the given options:

- **Tyrosine** and **Serine** can be synthesized in the human body (they are non-essential).
- **Glycine** is also non-essential.
- **Histidine** is an essential amino acid, especially important for infants and growing children.

Final answer:

Option C — **Histidine** is an essential amino acid.

Question29

What is the number of $> C = C <$ bonds present in a linolenic acid molecule?

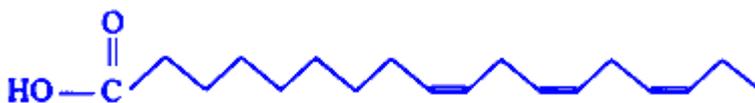
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Options:

- A. Zero
- B. One
- C. Two
- D. Three

Answer: D

Solution:



The IUPAC name of Linolenic acid is 9, 12, 15-octadecatrienoic acid which means it has three $> C = C <$ bonds.

Question30



Which from following pairs of carbohydrates produce equal quantity of glucose on hydrolysis per mole?

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Options:

- A. Sucrose and Lactose
- B. Lactose and Maltose
- C. Sucrose and Maltose
- D. Raffinose and Maltose

Answer: A

Solution:

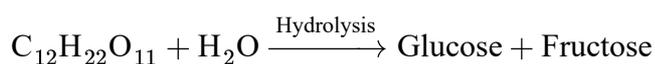
Let us analyze each option step-by-step using NCERT methods and concepts.

First, recall the structures:

1. **Sucrose:** Disaccharide, made of 1 glucose + 1 fructose.
2. **Lactose:** Disaccharide, made of 1 glucose + 1 galactose.
3. **Maltose:** Disaccharide, made of 2 glucose units.
4. **Raffinose:** Trisaccharide, made of 1 glucose + 1 fructose + 1 galactose.

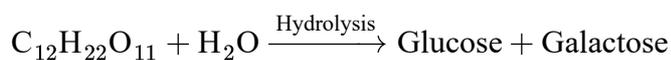
Now, see the number of glucose units obtained on hydrolysis for each:

- **Sucrose:**



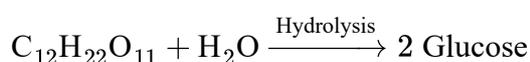
→ 1 glucose per mole.

- **Lactose:**



→ 1 glucose per mole.

- **Maltose:**



→ 2 glucose per mole.



- **Raffinose:**



→ 1 glucose per mole.

Now check each option:

- **Option A (Sucrose and Lactose):**

Both give 1 mole of glucose per mole of each disaccharide.

- **Option B (Lactose and Maltose):**

Lactose gives 1 mole glucose; maltose gives 2 moles glucose.

- **Option C (Sucrose and Maltose):**

Sucrose gives 1 mole glucose; maltose gives 2 moles glucose.

- **Option D (Raffinose and Maltose):**

Raffinose gives 1 mole glucose; maltose gives 2 moles glucose.

Final Answer:

Option A (Sucrose and Lactose) produce equal quantity of glucose on hydrolysis per mole.

Question31

Which from following carbohydrates produces double quantity of glucose on hydrolysis per mole as compared with sucrose?

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Options:

- A. Lactose
- B. Raffinose
- C. Stachyose
- D. Maltose

Answer: D

Solution:

- **Sucrose** on hydrolysis gives 1 mole of glucose and 1 mole of fructose per mole, i.e. **1 mole glucose per mole sucrose**.

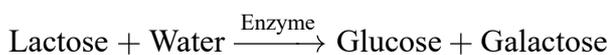
We need a carbohydrate that gives **2 moles of glucose per mole**, i.e., "double the quantity of glucose as compared to sucrose."

Now, let's check each option:

Option A: Lactose

Lactose is made of one molecule of glucose and one molecule of galactose.

Hydrolysis:



So, **per mole of lactose, we get 1 mole of glucose**.

Option B: Raffinose

Raffinose is a trisaccharide: galactose + glucose + fructose.

Hydrolysis:



So, **per mole of raffinose, we get 1 mole of glucose**.

Option C: Stachyose

Stachyose is a tetrasaccharide: 2 galactose + 1 glucose + 1 fructose.

Hydrolysis:



So, **per mole of stachyose, we get 1 mole of glucose**.

Option D: Maltose

Maltose is a disaccharide: glucose + glucose.

Hydrolysis:



So, **per mole of maltose, we get 2 moles of glucose**.

Conclusion

- Sucrose gives **1 mole of glucose**
- **Maltose gives 2 moles of glucose** (which is double compared to sucrose)

Final Answer:

Maltose (Option D)

Question32

Identify a side chain (R) group present in serine, an amino acid.

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Options:

A. CH_3-

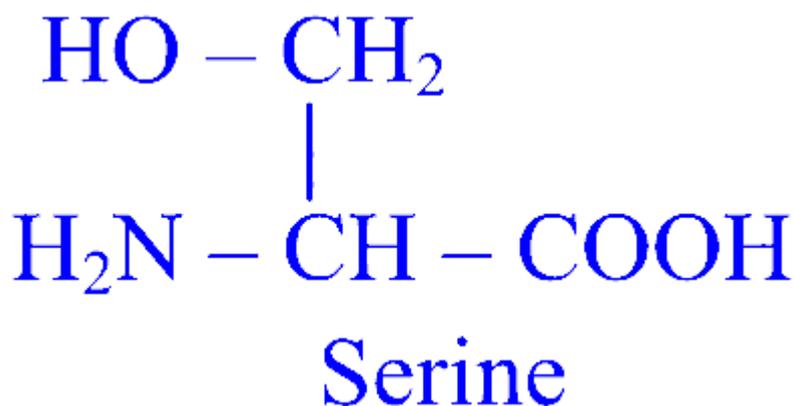
B. $\text{H}_3\text{C} - \text{CHOH}-$

C. $\text{Me}_2\text{CH}-$

D. $\text{HO} - \text{CH}_2-$

Answer: D

Solution:



Question33

What is the number of moles of water molecules required for complete hydrolysis of n mole triglyceride?

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Options:

A. 4n

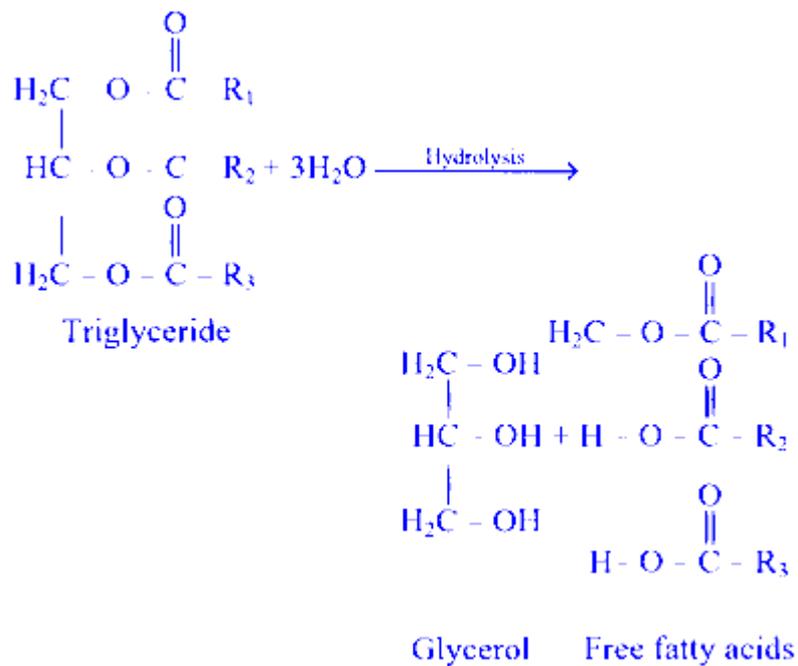
B. 3n

C. 2n

D. n

Answer: B

Solution:



Question34

Identify the pair of carbohydrates containing galactose as one of constituent in both of them.

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Options:

A. Sucrose and Stachyose

B. Maltose and Raffinose

C. Raffinose and Stachyose

D. Lactose and Maltose

Answer: C

Solution:

Galactose is a monosaccharide (a simple sugar) that can be a part of some disaccharides and oligosaccharides.

Let's analyze each option:

Option A: Sucrose and Stachyose

- Sucrose = Glucose + Fructose
- Stachyose = Galactose + Galactose + Glucose + Fructose

Stachyose has galactose, but sucrose does not.

Option B: Maltose and Raffinose

- Maltose = Glucose + Glucose
- Raffinose = Galactose + Glucose + Fructose

Raffinose has galactose, but maltose does not.

Option C: Raffinose and Stachyose

- Raffinose = Galactose + Glucose + Fructose
- Stachyose = Galactose + Galactose + Glucose + Fructose

Both contain galactose.

Option D: Lactose and Maltose

- Lactose = Glucose + Galactose
- Maltose = Glucose + Glucose

Only lactose has galactose.

Correct Answer:

Option C: Raffinose and Stachyose

Question35

What type of glycosidic linkages are developed when excess glucose is to be stored for future use in animals?

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Options:

A. $\beta - 1, 4$ and $\alpha - 1, 4$

B. $\alpha - 1, 6$ and $\beta - 1, 4$

C. $\beta - 1, 6$ and $\beta - 1, 4$

D. $\alpha - 1, 4$ and $\alpha - 1, 6$

Answer: D

Solution:

In animals, excess glucose is stored in the form of glycogen. Glycogen is a highly branched polysaccharide that involves two main types of glycosidic linkages:

Primary Chains:

$\alpha - 1, 4$ **Glycosidic Linkages:** These linkages form the linear chains of glucose molecules in glycogen.

Branch Points:

$\alpha - 1, 6$ **Glycosidic Linkages:** These linkages form the branch points, allowing glycogen to have a highly branched structure.

Thus, the correct answer is:

Option D

$\alpha - 1, 4$ and $\alpha - 1, 6$

Question36

Which from following nitrogen bases of nucleic acids is derived from purine?

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Options:

A. Cytosine

B. Guanine

C. Uracil

D. Thymine

Answer: B

Solution:

Option B: Guanine is derived from purine.

Purines are one of the two types of nitrogenous bases found in nucleic acids, the other being pyrimidines. Purines have a two-ring structure, while pyrimidines have a single-ring structure. The purine bases found in DNA and RNA are adenine and guanine. Among the options provided:

Cytosine, Uracil, and Thymine are all pyrimidines, characterized by their single-ring structure.

Guanine is a purine, featuring a double-ring structure, making it one of the bases derived from purine.

In summary, purines include:

Adenine (A)

Guanine (G)

Pyrimidines include:

Cytosine (C)

Thymine (T) (found only in DNA)

Uracil (U) (found only in RNA)

Therefore, among the given options, guanine is the correct answer.

Question37

What is the number of moles of oxygen and number of moles of N atoms respectively present in one mole thymine?

MHT CET 2024 16th May Morning Shift

Options:

A. 2 and 2

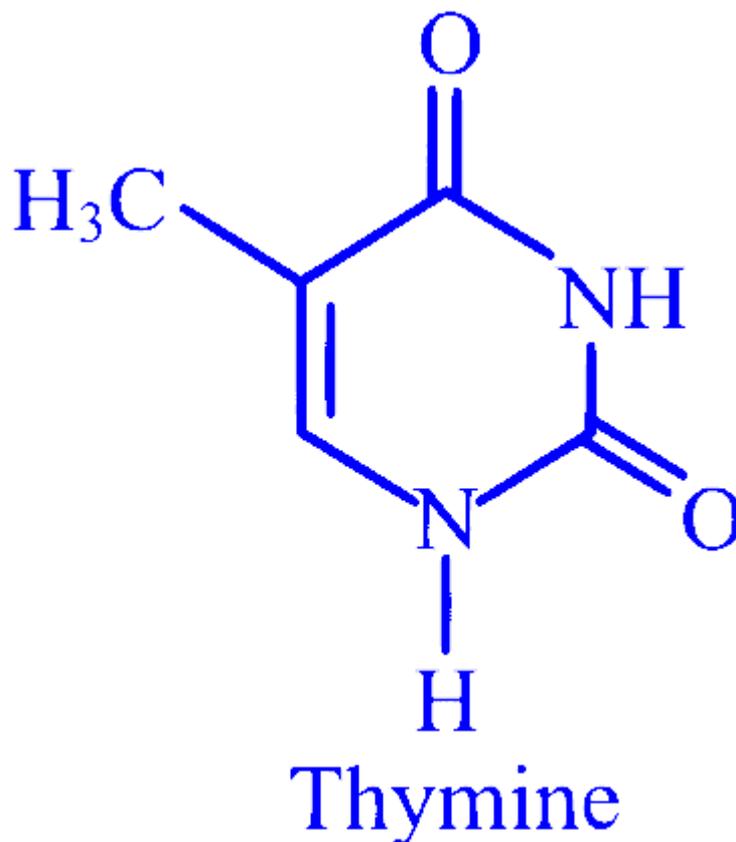
B. 1 and 5

C. 1 and 3

D. 2 and 3

Answer: A

Solution:



Moles of oxygen atoms = 2

Moles of nitrogen atoms = 2

Question38

Identify acidic amino acid from following (represented by using three letter symbols)

MHT CET 2024 16th May Morning Shift

Options:

- A. Glu
- B. Gly
- C. Gln
- D. Arg

Answer: A

Solution:**Option A: Glu**

Glu represents glutamic acid, which is classified as an acidic amino acid because it has a carboxylate group in its side chain that can donate a proton, thereby increasing the acidity. The presence of an additional carboxyl group in the side chain contributes to its acidic nature, with a side chain pKa around 4.1.

Glutamic acid plays an essential role in cellular metabolism as a precursor to neurotransmitters and in the urea cycle. Additionally, it is involved in protein synthesis and serves as a key metabolic intermediate.

Question39

Identify the correct statement about glucose from following.

MHT CET 2024 15th May Evening Shift

Options:

- A. It is aldohexose.
- B. It is nonreducing sugar.
- C. It contains three chiral carbon atoms.
- D. Its ring structure is hemiketal.

Answer: A

Solution:

Answer: Option A (It is aldohexose)

Explanation:

It is aldohexose: Glucose has the functional group of an aldehyde ($-\text{CHO}$) and consists of six carbon atoms in its chain form, making it an aldohexose. This statement is correct.

It is nonreducing sugar: Glucose, in its open-chain form, has a free aldehyde group which can be oxidized. Therefore, it can reduce certain reagents (like Benedict's solution), making glucose a reducing sugar. Hence, this statement is incorrect.

It contains three chiral carbon atoms: In its open-chain form, D-glucose has four chiral carbon atoms (at C2, C3, C4, and C5). Thus, the statement that it has three chiral carbon atoms is incorrect.

Its ring structure is hemiketal: When glucose cyclizes, the aldehyde group at C1 reacts with the hydroxyl group at C5 to form a six-membered ring, known as a pyranose ring. This intramolecular reaction produces a hemiacetal, not a hemiketal, because it involves an aldehyde, not a ketone. Therefore, this statement is incorrect.

Only the first statement (It is aldohexose) is correct.

Question40

The correct zwitter ion structure of glycine is

MHT CET 2024 15th May Evening Shift

Options:



Answer: B

Solution:

The correct zwitterion structure of glycine is

Option B:



A zwitterion is a molecule that carries both positive and negative charges, but the net charge of the molecule is zero. In the case of glycine, the amino group (NH_2) accepts a proton, becoming NH_3^+ , while the carboxylic acid group (COOH) donates a proton, becoming COO^- . This structure stabilizes the molecule in an aqueous environment and is prevalent at the isoelectric point, where the pH of the solution causes the molecule to have no overall electrical charge.

Question41

How many amino acids are linked together by $(n - 1)$ amide bonds?

MHT CET 2024 15th May Morning Shift

Options:

A. $n - 1$

B. n

C. $n + 1$

D. $2n$

Answer: B

Solution:

The correct answer is **Option B: n** .

When n amino acids are linked together in a polypeptide chain, they are connected by $(n - 1)$ amide bonds. This is because each time two amino acids are joined, they form one amide bond, also known as a peptide bond. Consequently, for n amino acids:

The first amino acid does not require an amide bond to be linked to a preceding amino acid because it is the starting point.

Each subsequent amino acid (second through n -th) contributes to forming a new peptide bond with the previous one.

Thus, a chain of n amino acids will result in exactly $(n - 1)$ amide bonds connecting them.

Question42

What is the number of amino acids present in single turn of α -helix of protein?

MHT CET 2024 15th May Morning Shift

Options:

A. 1.3

B. 3.1

C. 3.6

D. 6.3

Answer: C

Solution:

In a single turn of an α -helix, there are approximately 3.6 amino acids. This is characteristic of the α -helix structure, which is a common secondary structure in proteins. The pitch of the helix, which is the linear distance along the helix axis for one complete turn, is about 5.4 Å. Given this structural formation, 3.6 amino acids per turn help facilitate hydrogen bonding, where the carbonyl oxygen of one amino acid residue forms a hydrogen bond with the amide hydrogen of another four residues away in the sequence.

Thus, the correct option is C: 3.6.

Question43

Which from following proteins acts as an enzyme to break protein to α -amino acid?

MHT CET 2024 11th May Evening Shift

Options:

A. Trypsine

B. Pepsin



C. Myosine

D. Keratine

Answer: B

Solution:

Option B: Pepsin

Pepsin is an enzyme that functions in the breakdown of proteins into smaller peptides, ultimately leading to the production of α -amino acids. It is one of the main digestive enzymes in the stomach, where it performs its function under acidic conditions. Pepsin specifically cleaves peptide bonds at the aromatic amino acids such as phenylalanine, tryptophan, and tyrosine, leading to shorter polypeptide chains. These shorter chains are further broken down into individual α -amino acids by other proteases and peptidases in the digestive tract.

Here is a brief description of the other options:

Trypsin (Option A): While trypsin is also a proteolytic enzyme, it acts in the small intestine and targets peptide bonds on the carboxyl side of lysine and arginine.

Myosine (Option C): Myosin is not an enzyme but a motor protein responsible for muscle contraction.

Keratine (Option D): Keratin is a protein that forms the structure of hair, nails, and the epidermis of the skin, and does not act as an enzyme.

Therefore, the correct answer is **Option B: Pepsin**.

Question44

Which from following compounds is obtained when glucose is heated with HI for longer time?

MHT CET 2024 11th May Morning Shift

Options:

A. Glucose cyanohydrin

B. Glucose oxime

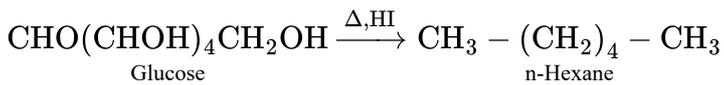
C. n-Hexane

D. Saccharic acid



Answer: C

Solution:



Question45

Identify fibrous protein from following.

MHT CET 2024 11th May Morning Shift

Options:

- A. Legumelin
- B. Myosin
- C. Insulin
- D. Serum albumin

Answer: B

Solution:

Option B: Myosin

Myosin is a fibrous protein that plays a crucial role in muscle contraction and cellular movement. It is part of the myofibrils in muscle cells, helping generate force and movement when interacting with actin filaments. In contrast, the other proteins listed, such as legumelin, insulin, and serum albumin, are globular proteins that serve various functions, such as enzyme activity, hormone signaling, and transport.

Question46

Identify acidic amino acid from following (represented by using three letter symbols).

MHT CET 2024 10th May Evening Shift

Options:

A. Arg

B. Asp

C. Asn

D. Ala

Answer: B

Solution:

The acidic amino acid identified from the options is Asp (Aspartic acid).

Explanation:

Amino acids are the building blocks of proteins, and their side chains determine their chemical properties. Among the 20 standard amino acids, only a few have acidic side chains. These are characterized by their ability to donate a proton (H^+) easily, giving them a negative charge at physiological pH.

Arg (Arginine): A basic amino acid with a positively charged side chain at physiological pH due to the guanidinium group.

Asp (Aspartic Acid): An acidic amino acid with a carboxyl group in its side chain, making it negatively charged at physiological pH.

Asn (Asparagine): A neutral amino acid with an amide group in its side chain, which does not carry a charge at physiological pH.

Ala (Alanine): A neutral, non-polar amino acid with a simple methyl group as its side chain, not exhibiting acidic or basic characteristics.

In conclusion, the acidic amino acid from the list provided is **Aspartic acid (Asp)**.

Question47

Which from following is NOT a salient feature of Watson and Crick model for DNA?

MHT CET 2024 10th May Morning Shift

Options:

- A. Polynucleotide strands wind in to a right handed double helix.
- B. Sugar-phosphate back bone lies at in side and bases lie out side of helix.
- C. Double helix is stabilized by hydrogen bonding formed in two strands.
- D. A = T and G = C are complementary base pairs.

Answer: B

Solution:

Option B: Sugar-phosphate back bone lies at inside and bases lie outside of helix.

In the Watson and Crick model for DNA, the sugar-phosphate backbone actually lies on the outside of the helix, while the nitrogenous bases are on the inside, paired between the two strands forming the double helix structure.

Question48

Which from following statements is NOT true for nucleic acids?

MHT CET 2024 10th May Morning Shift

Options:

- A. 5' end of polynucleotide has free phosphate group.
- B. Nucleic acids contain back bone formed of $-C - O - C-$ linkage.
- C. Polynucleotide has free -OH group at 3' end.
- D. Neighbouring nucleotides are bonded through phosphate diester linkage.

Answer: B

Solution:

Option B is NOT true for nucleic acids.



In nucleic acids, the backbone is formed by a sugar-phosphate linkage rather than a $-C - O - C-$ linkage. The backbone is composed of alternating sugar and phosphate groups, connected by phosphodiester bonds. Each phosphate group links the 3' carbon atom of one sugar molecule to the 5' carbon atom of the next sugar molecule, which forms the characteristic sugar-phosphate-sugar chain of DNA and RNA.

Question49

Identify the carbon atoms of glucose and of fructose forming glycosidic bond in sucrose.

MHT CET 2024 9th May Evening Shift

Options:

- A. C -1 of α -glucose and C - 2 of β -fructose
- B. C -1 of β -glucose and C -2 of β -fructose
- C. C -2 of α -glucose and C -2 of β -fructose
- D. C-3 of α -glucose and C - 1 of β -fructose

Answer: A

Solution:

Structure of sucrose contains glycosidic linkage between C - 1 of α -glucose and C -2 of β -fructose. Aldehyde and ketone groups of both the monosaccharide units are involved in formation of the glycosidic bond.

Question50

Which from following is NOT a globular protein?

MHT CET 2024 9th May Evening Shift

Options:

- A. Myosin
- B. Insulin
- C. Egg albumin
- D. Legumelin

Answer: A

Solution:

Myosin is NOT a globular protein.

Explanation:

Proteins are generally categorized according to their shape and solubility into two main types: globular and fibrous.

Globular proteins are generally soluble in water and form a spherical shape. Examples include enzymes, hemoglobin, insulin, and albumins like egg albumin.

Fibrous proteins are generally insoluble in water and have elongated, thread-like structures. These proteins often play a structural role in cells and tissues. Myosin, a key component of muscle fibers, is a fibrous protein due to its long, extended structure that facilitates its role in muscle contraction.

Therefore, among the given options, myosin is a fibrous protein, whereas insulin, egg albumin, and legumelin are globular proteins.

Question51

Identify fibrous protein from following.

MHT CET 2024 9th May Morning Shift

Options:

- A. Legumelin
- B. Serum albumin
- C. Myosin
- D. Insulin

Answer: C

Solution:

Myosin is the fibrous protein from the provided options. Myosin is a motor protein found in muscle tissues and is responsible for muscle contraction. It has a fibrous structure because it is composed of long, thread-like chains that enable its function in the cytoskeleton and muscle fibers.

Question52

Identify glycosidic linkage present in maltose.

MHT CET 2024 9th May Morning Shift

Options:

- A. $\alpha, \beta - 1, 2$ glycosidic
- B. $\alpha - 1, 4$ glycosidic
- C. $\beta - 1, 4$ glycosidic
- D. $\alpha - 1, 6$ glycosidic

Answer: B

Solution:

The glycosidic linkage in maltose is formed between C -1 of one α -D-glucose molecule and C-4 of another α -D-glucose molecule.

Question53

What is the number of moles of nitrogen atoms present in one mole cytosine?

MHT CET 2024 4th May Evening Shift

Options:

A. 5

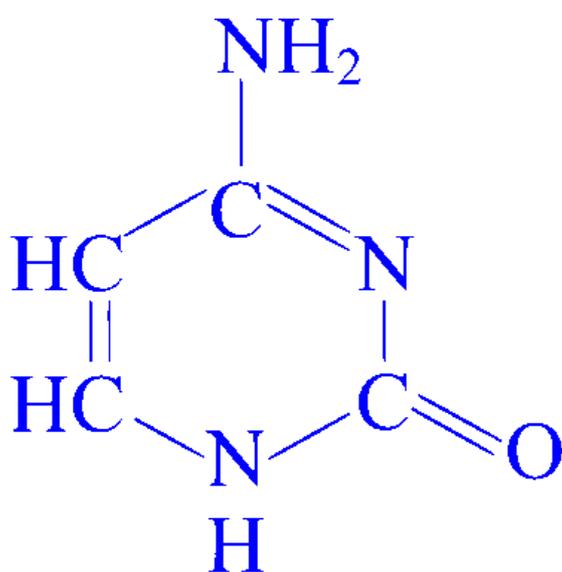
B. 4

C. 3

D. 2

Answer: C

Solution:



Cytosine

Thus, one mole of cytosine contains 3 moles of nitrogen atoms.

Question54

Identify basic amino acid from following.



MHT CET 2024 4th May Evening Shift

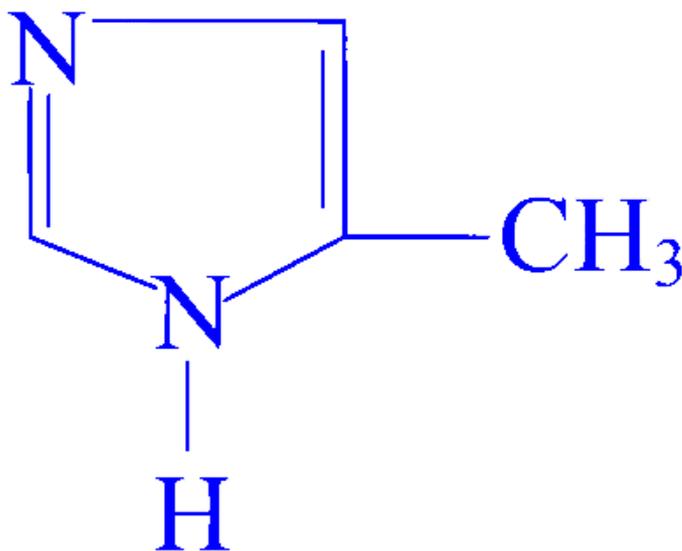
Options:

- A. Tryptophan
- B. Threonine
- C. Phenylalanine
- D. Histidine

Answer: D

Solution:

The side chain of histidine is



Histidine contains nitrogen in its side chain. Hence, it is a basic amino acid.

Question55

Which from following statements is **CORRECT** about saccharic acid?



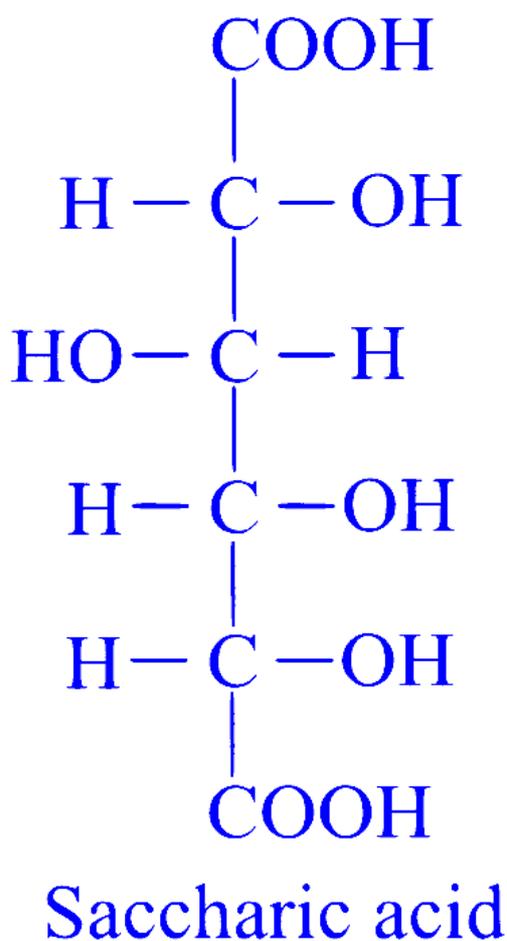
MHT CET 2024 4th May Morning Shift

Options:

- A. It contains two carboxyl and four hydroxyl groups.
- B. It contains one carboxyl group and five hydroxyl groups.
- C. It contains two carboxyl groups and five hydroxyl groups.
- D. It contains three carboxyl and two hydroxyl groups.

Answer: A

Solution:



Hence, it contains two carboxyl and four hydroxyl groups.

Question56

Which from following compounds is used to prepare adipic acid using enzymes in green technology developed by Drath and Frost?

MHT CET 2024 4th May Morning Shift

Options:

- A. Ribose
- B. Glucose
- C. Ribulose
- D. Benzene

Answer: B

Solution:

Adipic acid can be prepared using green technology through the use of enzymes starting from **Option B: Glucose**. Drath and Frost developed a method utilizing enzyme-based catalysis for the conversion of glucose, a renewable resource, into adipic acid, which is a more environmentally friendly approach compared to traditional chemical synthesis methods that often involve petroleum-based compounds like benzene. This biocatalytic process leverages the specificity and efficiency of enzymes, aligning with the principles of green chemistry by reducing hazardous byproducts and improving overall sustainability.

Question57

Which of the following one letter symbol is used to represent aspartic acid?

MHT CET 2024 4th May Morning Shift



Options:

- A. D
- B. R
- C. A
- D. S

Answer: A

Solution:

The one-letter symbol used to represent aspartic acid is **D**.

In the context of amino acids, each has a specific one-letter code that simplifies the representation of protein sequences. Aspartic acid, by convention, is denoted by the letter **D**. Here is a brief overview of how some common amino acids are represented:

Alanine is represented by **A**.

Arginine is represented by **R**.

Serine is represented by **S**.

Hence, for aspartic acid, the correct choice is **Option A: D**.

Question58

What is the number of moles of N atoms and number of moles of O atoms respectively present in one mole of uracil?

MHT CET 2024 3rd May Evening Shift



Options:

A. 1 and 5

B. 1 and 3

C. 2 and 3

D. 2 and 2

Answer: D

Solution:

Uracil has the molecular formula $C_4H_4N_2O_2$.

So, in **1 mole of uracil** :

- Nitrogen atoms: 2 per molecule \rightarrow **2 moles of N atoms**
- Oxygen atoms: 2 per molecule \rightarrow **2 moles of O atoms**

Correct option: D (2 and 2)

Question59

Which 'c' atom of ribose sugar (numbered from 1' to 5') bonds with phosphate group to form AMP?

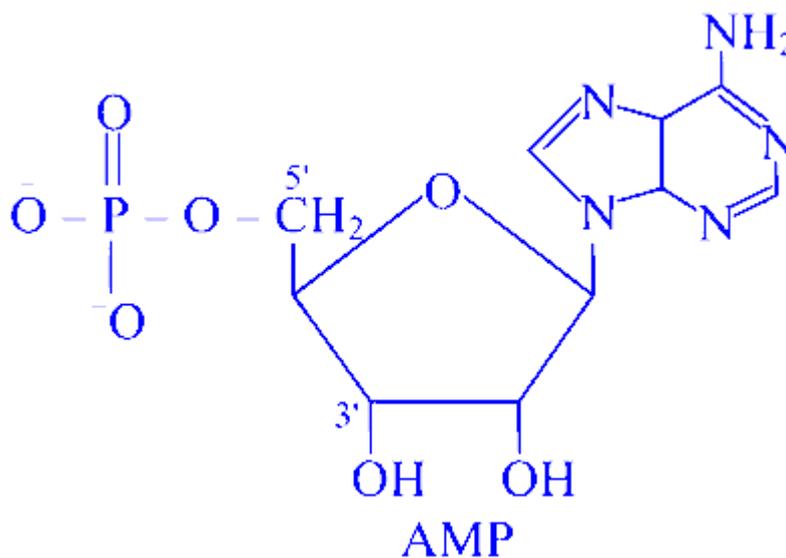
MHT CET 2024 3rd May Evening Shift

Options:

- A. 1'
- B. 3'
- C. 4'
- D. 5'

Answer: D

Solution:



Question60

If Cell – OH represents formula of cellulose, identify the formula of cellulose xanthate from following.

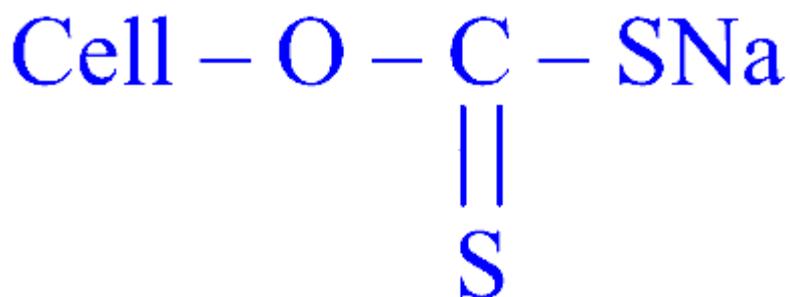


MHT CET 2024 3rd May Evening Shift

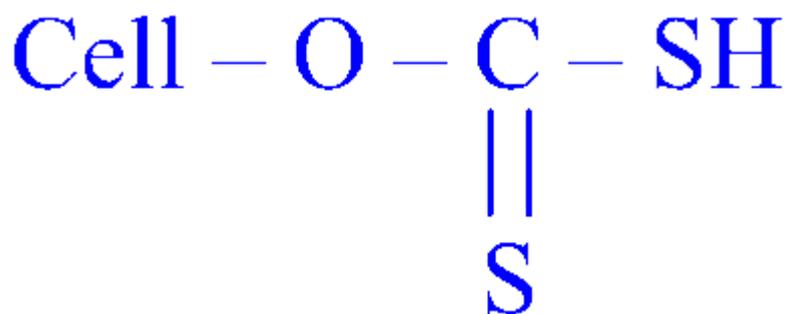
Options:

A. Cell – ONa

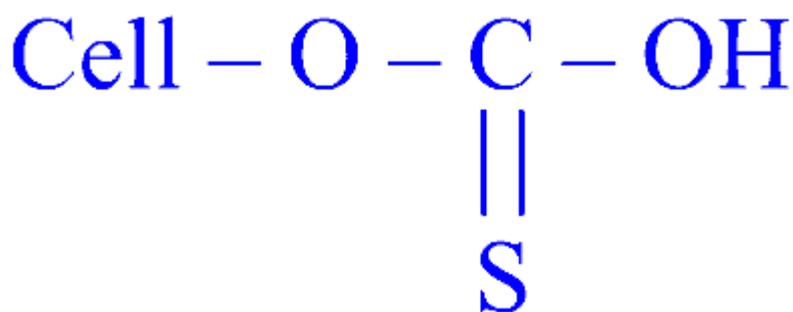
B.



C.



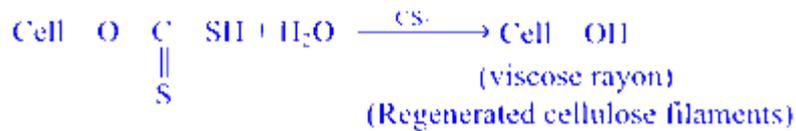
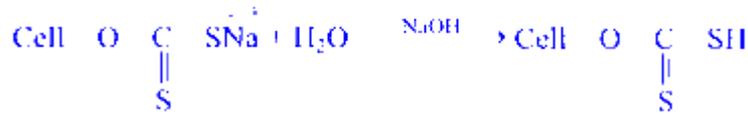
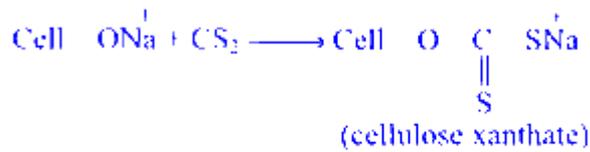
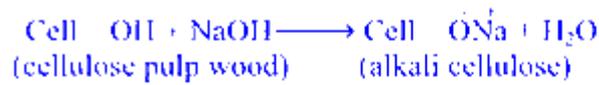
D.



Answer: B

Solution:





Question61

Identify essential amino acid from following.

MHT CET 2024 3rd May Morning Shift

Options:

- A. Glutamic acid
- B. Proline
- C. Cysteine
- D. Histidine

Answer: D

Solution:

Histidine is an essential amino acid. Essential amino acids are those that the human body cannot synthesize on its own and must be obtained through the diet.

In total, there are nine essential amino acids:

Histidine

Isoleucine

Leucine

Lysine

Methionine

Phenylalanine

Threonine

Tryptophan

Valine

Histidine plays a crucial role in growth, the creation of blood cells, and tissue repair. It is also a precursor to histamine, an important metabolite involved in immune response, digestion, and neurotransmission.

Thus, the correct answer is:

Option D: Histidine

Question62

Identify molecular formula of laevulose

MHT CET 2024 3rd May Morning Shift

Options:

A. $C_6H_{12}O_6$

B. $C_5H_{10}O_5$

C. $C_4H_8O_4$

D. $C_3H_6O_3$

Answer: A

Solution:

The molecular formula for laevulose, also known as fructose, is:

$C_6H_{12}O_6$

Laevulose is a monosaccharide and a hexose sugar, which means it contains six carbon atoms. This matches with option A, which is the molecular formula for many simple sugars, including glucose and fructose. These sugars are structural isomers of each other, sharing the same molecular formula but differing in structure.



Question63

Identify the nitrogen atom of purine base that bonds with 1' carbon of ribose to form ribonucleoside?

MHT CET 2024 2nd May Evening Shift

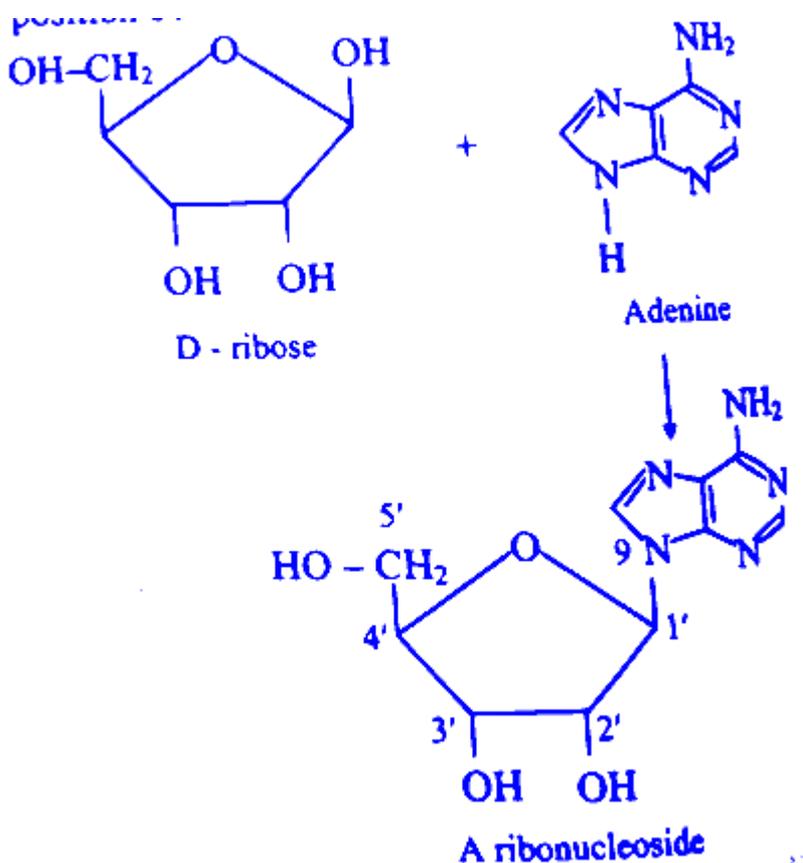
Options:

- A. 1st
- B. 3rd
- C. 7th
- D. 9th

Answer: D

Solution:

With purine bases, the nitrogen atom at the 9th position bonds with 1' carbon atom of the sugar.



Question64

Which from following n mole molecules of carbohydrate contains $2n$ mole molecules of galactose, n moles of glucose and n moles of fructose in it?

MHT CET 2024 2nd May Evening Shift

Options:

- A. Lactose
- B. Raffinose
- C. Amylose
- D. Stachyose

Answer: D

Solution:

The carbohydrate that contains $2n$ mole molecules of galactose, n moles of glucose, and n moles of fructose is **Stachyose**.

Stachyose is a type of oligosaccharide composed of:

2 galactose units

1 glucose unit

1 fructose unit

In molecular terms:

Galactose provides the $2n$ moles, as two galactose molecules are present.

Glucose provides the n moles, as one glucose molecule is present.

Fructose provides the n moles, as one fructose molecule is present.

Therefore, Stachyose fits the given requirement by containing twice as many molecules of galactose as glucose or fructose.



Question65

Identify false statement from following.

MHT CET 2024 2nd May Morning Shift

Options:

- A. Cellulose is constituent of cell wall in animal cells.
- B. Starch is common constituent of food grains.
- C. Lactose is constituent of milk.
- D. Animals store polysaccharides in their body in the form of glycogen.

Answer: A

Solution:

Option A is false.

Cellulose is a major component of the cell wall in plant cells, not in animal cells. Unlike plants, animal cells do not have a rigid cell wall; instead, they have a flexible cell membrane. The cell wall in plants provides structure, support, and protection, and is primarily composed of cellulose, a structural polysaccharide.

To elaborate further:

Cellulose is a linear chain of glucose molecules and is a primary structural component, contributing to the rigidity and strength of plant cell walls.

Animals, on the other hand, lack cellular structures containing cellulose, as they rely on different mechanisms for support and protection, including skeletal systems and body structures.

Explanation for Other Options:

Option B: Starch is indeed a common constituent of food grains and serves as a primary storage form of energy in plants. It consists of two types of molecules: amylose and amylopectin.

Option C: Lactose is a disaccharide sugar present in milk. It is composed of glucose and galactose units.

Option D: Animals store polysaccharides in the form of glycogen, primarily in liver and muscle tissues. Glycogen is an energy reserve that can be rapidly mobilized when needed.

These facts highlight the distinctions between biological functionalities and components present in plants versus animals.

Question66

Identify glycosidic linkages for formation of chain and branches respectively in amylopectin.

MHT CET 2024 2nd May Morning Shift

Options:

- A. $\beta - 1, 6$ and $\alpha - 1, 6$
- B. $\alpha - 1, 6$ and $\beta - 1, 4$
- C. $\beta - 1, 4$ and $\alpha - 1, 6$
- D. $\alpha - 1, 4$ and $\alpha - 1, 6$

Answer: D

Solution:

In amylopectin, the chain formation is due to glycosidic linkages, and the branching occurs at specific points. The linear chains of amylopectin are composed of glucose units connected by $\alpha - 1, 4$ glycosidic linkages. The branches occur through $\alpha - 1, 6$ glycosidic linkages.

Thus, the correct option is:

Option D

$\alpha - 1, 4$ and $\alpha - 1, 6$

Question67

What type of peptide is the glycylalanine?

MHT CET 2023 14th May Evening Shift

Options:

- A. Dipeptide



- B. Tripeptide
- C. Tetrapeptide
- D. Pentapeptide

Answer: A

Solution:

Glycylalanine is a peptide formed by the linkage of two amino acids: glycine and alanine. This linkage occurs through a peptide bond, which is a covalent bond that joins the carboxyl group of one amino acid to the amine group of another with the release of a water molecule (a condensation reaction). Since glycylalanine consists of only two amino acids connected by a single peptide bond, it is classified as a dipeptide. Therefore, the correct answer is:

Option A: Dipeptide

Question68

Which of the following is NOT a basic amino acid?

MHT CET 2023 14th May Evening Shift

Options:

- A. Proline
- B. Lysine
- C. Arginine
- D. Histidine

Answer: A

Solution:

The term "basic amino acid" refers to amino acids that have side chains with a net positive charge at physiological pH (approximately pH 7.4). Basic amino acids are typically those that contain nitrogen and can accept a hydrogen ion, making them positively charged. Among the options provided, let's consider each amino acid:

- **Proline (Option A):** Proline is unique among the twenty standard amino acids because it has a secondary amine group, where the amino nitrogen is bound to two alkyl groups. Its side chain is a cyclic structure. Proline is classified as a nonpolar, aliphatic amino acid and is not basic; it does not carry a positive charge at physiological pH.
- **Lysine (Option B):** Lysine has a side chain with an aliphatic terminal (straight-chain) amine group, which is positively charged at physiological pH. This makes lysine a basic amino acid.
- **Arginine (Option C):** Arginine contains a side chain with a complex guanidinium group, which has a high pKa and thus remains positively charged at physiological pH. Therefore, arginine is considered a basic amino acid.
- **Histidine (Option D):** Histidine has an imidazole side chain, which can be positively charged at slightly acidic to neutral pH. Histidine's side chain has a pKa around 6.0, making it occasionally positively charged at physiological pH, and thus, histidine is sometimes considered a basic amino acid, especially since it can form hydrogen bonds and salt bridges.

From the options provided, **Option A, Proline**, is the correct answer. Proline is not a basic amino acid; it does not have a positive charge on its side chain at physiological pH.

Question69

Identify non reducing sugar from following.

MHT CET 2023 14th May Morning Shift

Options:

- A. Sucrose
- B. Maltose
- C. Lactose
- D. Glucose

Answer: A

Solution:

To identify a non-reducing sugar from the options provided, we need to consider the structure and chemical reactivity of each. Reducing sugars are those that have a free aldehyde or ketone group capable of acting as a reducing agent, typically through an oxidation-reaction where the sugar is oxidized while reducing another compound. Non-reducing sugars, on the other hand, do not have such free reactive groups.

Below, I'll explain the structure of each sugar given in the options to identify the non-reducing sugar.



- **Sucrose:** Sucrose is a disaccharide composed of glucose and fructose units. It is unique because in its structure, the anomeric carbon of glucose (which is the carbon linked to both the oxygen in the ring and the $-CH_2OH$ group outside the ring) is involved in the glycosidic bond with the anomeric carbon of fructose. As a result, neither glucose nor fructose parts of sucrose have a free anomeric carbon capable of acting as a reducing agent. Since the defining groups that classify sugars as reducing are "locked away" in the glycosidic bond, sucrose is considered a non-reducing sugar.
- **Maltose:** Maltose is a disaccharide made up of two glucose units. In the structure of maltose, one of the glucose units has a free anomeric carbon that is not involved in the glycosidic bond. This free anomeric carbon allows maltose to act as a reducing sugar.
- **Lactose:** Lactose is a disaccharide composed of glucose and galactose units. Similar to maltose, lactose has a free anomeric carbon on the galactose part of the molecule, which is not involved in the glycosidic bond, thus permitting lactose to behave as a reducing sugar.
- **Glucose:** Glucose is a monosaccharide with an aldehyde group, allowing it to be oxidized and hence act as a reducing sugar. Therefore, glucose is indeed a reducing sugar.

Given this information, the correct answer is:

Option A - Sucrose, as it is the only non-reducing sugar in the list due to both anomeric carbons being involved in the glycosidic bond. Therefore, it cannot participate in redox reactions that are characteristic of reducing sugars.

Question 70

In which of the following carbohydrate, molecular mass increases by $84u$ after complete acetylation?

MHT CET 2023 14th May Morning Shift

Options:

- A. Aldotriose
- B. Aldotetrose
- C. Ketotetrose
- D. Ketopentose

Answer: A

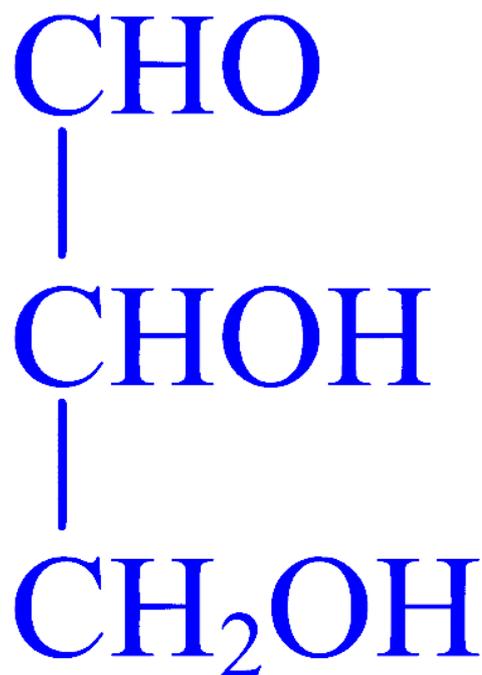
Solution:

In acetylation reaction H atom of an ($-\text{OH}$) group is replaced by an acetyl group ($-\text{COCH}_3$). This results increase in molecular mass by $[(12 + 16 + 12 + 3 \times 1) - 1]$, that is, 42u .

Increase in molecular mass = 84u

\therefore Number of $-\text{OH}$ groups = $\frac{84\text{u}}{42\text{u}} = 2$

The carbohydrate must be aldotriose as it contains two alcoholic groups.



Question 71

Identify glycosidic linkage present in maltose.

MHT CET 2023 13th May Evening Shift

Options:

A. $\beta - 1, 4$

B. $\alpha - 1, 6$

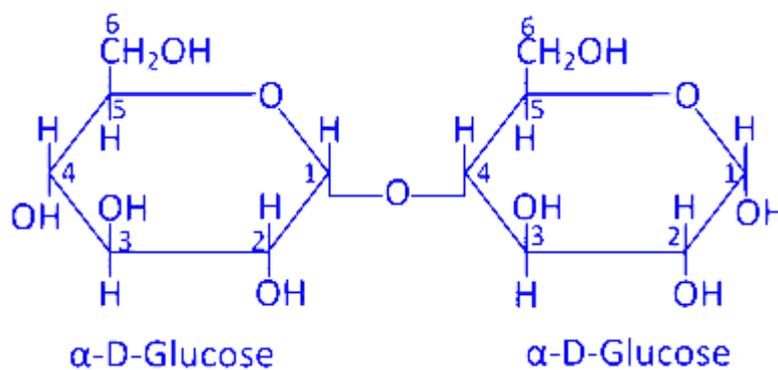
C. $\beta - 1, 6$

D. $\alpha - 1, 4$

Answer: D

Solution:

Maltose is composed of two $\alpha - D$ -glucose units in which C_1 of one glucose is linked to C_4 of another glucose unit.



Question72

Which of the following is not a disaccharide?

MHT CET 2023 13th May Evening Shift

Options:

A. Sucrose

B. Maltose

C. Lactose

D. Raffinose

Answer: D



Solution:

Among the given options, raffinose is not a disaccharide. It is because it is a trisaccharide, made up of three monosaccharides namely galactose, glucose and fructose.

Question 73

Which of the following is NOT a globular protein?

MHT CET 2023 13th May Morning Shift

Options:

- A. Insulin
- B. Egg albumin
- C. Serum albumin
- D. Keratin

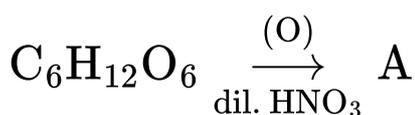
Answer: D

Solution:

Insulin, egg albumin and serum albumin are globular proteins while keratin is a fibrous protein.

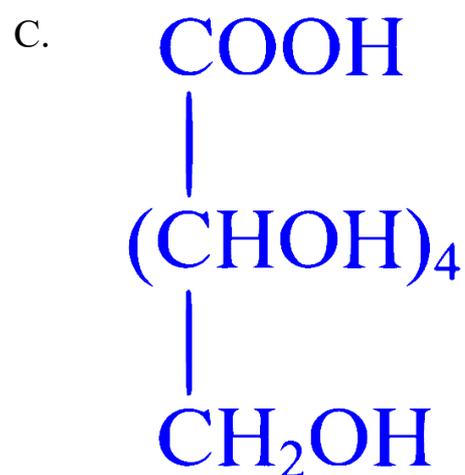
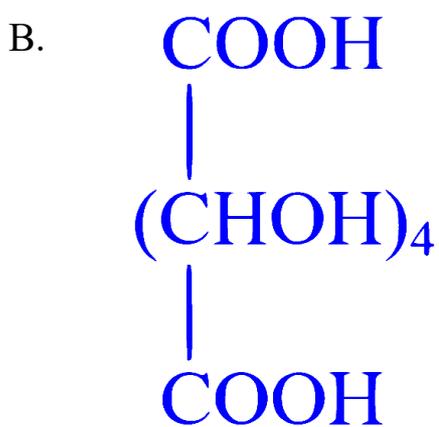
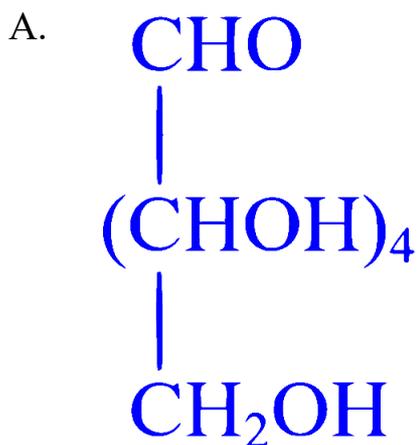
Question 74

Identify A in the following reaction.



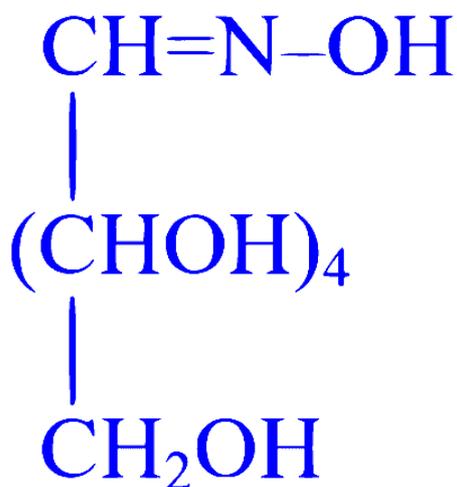
MHT CET 2023 13th May Morning Shift

Options:



D.

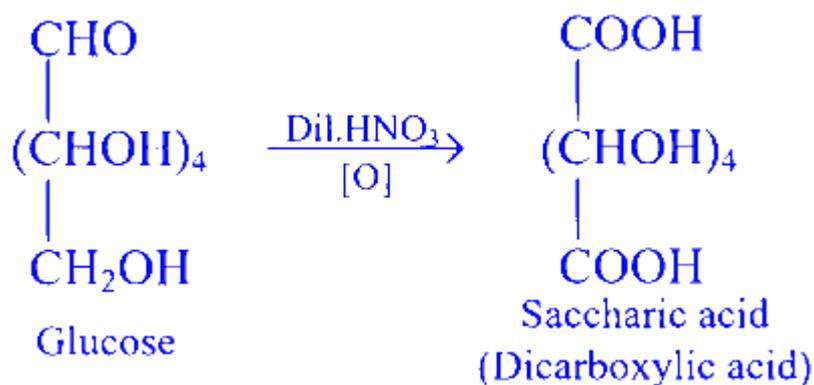




Answer: B

Solution:

Glucose on oxidation with dilute nitric acid gives saccharic acid.



Question 75

Which of the following is not a globular protein?

MHT CET 2023 12th May Evening Shift

Options:

- A. Myosin
- B. Insulin
- C. Legumelin
- D. Serum albumin

Answer: A

Solution:

Globular proteins are a common type of protein that are more or less soluble in aqueous solutions and have complex tertiary or quaternary structures. They typically carry out dynamic functions in organisms, such as catalyzing biochemical reactions (enzymes), transporting molecules (transport proteins), and regulating processes (hormones). Let's look at the options given:

- **Option A: Myosin** - Myosin is actually not a globular protein but rather a fibrous protein that functions in muscle contraction. It interacts with actin filaments in a process that converts chemical energy in the form of ATP to mechanical energy, thereby generating force and movement.
- **Option B: Insulin** - Insulin is a globular protein and a hormone that regulates glucose levels in the blood. It is produced by the pancreas and has a key role in the metabolism of carbohydrates, fats, and proteins.
- **Option C: Legumelin** - Legumelin is a globular storage protein found in seeds, such as those of legumes. It serves as a reserve of amino acids for the plant embryo during germination.
- **Option D: Serum albumin** - Serum albumin is the main protein in plasma and is also a globular protein. It has multiple roles including maintaining osmotic pressure, binding and transport of various substances in the blood.

Based on this information, the correct answer to the question—identifying the non-globular protein—would be:

Option A: Myosin

Question 76

What is the number of –OH groups present in one molecule of ribose?

MHT CET 2023 12th May Evening Shift



Options:

A. 2

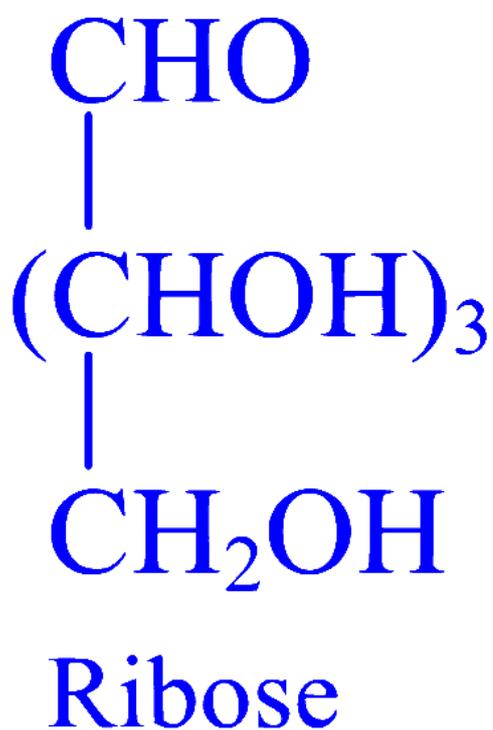
B. 3

C. 4

D. 5

Answer: C

Solution:



Question77

What type of glycosidic linkages are present in cellulose?



MHT CET 2023 12th May Morning Shift

Options:

A. $\beta - 1, 6$

B. $\beta - 1, 4$

C. $\alpha - 1, 6$

D. $\alpha - 1, 4$

Answer: B

Solution:

Cellulose is a straight chain polysaccharide of β -glucose units linked by $\beta - 1, 4$ -glycosidic bonds.

Question 78

What is the value of specific rotation exhibited by fructose molecule?

MHT CET 2023 12th May Morning Shift

Options:

A. $+52.7^\circ$

B. -92.4°

C. $+66.5^\circ$

D. -40.3°

Answer: B

Solution:



Fructose (specifically **D-fructose**) is **levorotatory** and shows a specific rotation of **about -92.4°** .

✔ Answer: B) -92.4°

Question79

Which of the following enzyme is found in saliva?

MHT CET 2023 11th May Evening Shift

Options:

- A. Amylase
- B. Lipase
- C. Glucose isomerase
- D. Proteoses

Answer: A

Solution:

Amylase, an enzyme present in saliva, hydrolyzes starch.

Question80

Which of the following phenomena is NOT explained by the open chain structure of glucose?

MHT CET 2023 11th May Evening Shift

Options:

- A. Formation of pentaacetate of glucose with acetic anhydride.



- B. Formation of oxime with hydroxylamine.
- C. Formation of silver mirror with Tollen's reagent.
- D. Existence of α and β forms of glucose.

Answer: D

Solution:

Glucose exists in two cyclic forms, α and β , which are formed by intramolecular hemiacetal formation between the aldehyde group and one of the alcoholic group at C – 5 within the molecule. Thus, the open chain structure of glucose does not explain the existence of α and β forms of glucose.

Question81

Which of following is NOT correct about fructose?

MHT CET 2023 11th May Morning Shift

Options:

- A. It is ketohexose.
- B. It is reducing sugar.
- C. It is laevorotatory.
- D. Its ring structure is hemiacetal.

Answer: D

Solution:

Ring structure of fructose is a hemiketal not hemiacetal.

Fructose ($C_6H_{12}O_6$) is a laevorotatory ketohexose. It is a reducing sugar.

Question82



Identify the reagent that confirms the presence of five –OH groups in glucose.

MHT CET 2023 11th May Morning Shift

Options:

A. NH_2OH

B. HCN

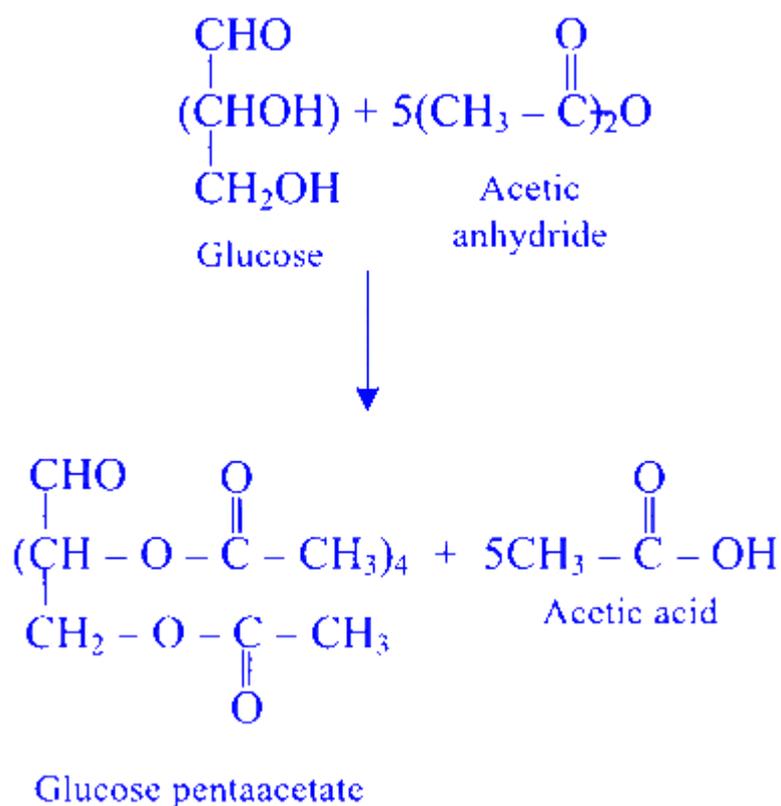
C. dil. HNO_3

D. Acetic anhydride

Answer: D

Solution:

Glucose reacts with acetic anhydride to form glucose pentaacetate. This confirms the presence of five hydroxyl groups in glucose.



Question83

Identify the glycosidic linkage present in lactose.

MHT CET 2023 10th May Evening Shift

Options:

A. $\beta - 1, 4$

B. $\alpha - 1, 6$

C. $\beta - 1, 6$

D. $\alpha - 1, 4$

Answer: A

Solution:

In lactose, the glycosidic linkage is formed between C – 1 of β -D-galactose and C – 4 of β -D-glucose.

Question84

Identify tetrasaccharide from following.

MHT CET 2023 10th May Evening Shift

Options:

A. Glycogen

B. Cellulose

C. Ribose

D. Stachyose

Answer: D



Solution:

(A)	Glycogen	Polysaccharide
(B)	Cellulose	Polysaccharide
(C)	Ribose	Monosaccharide
(D)	Stachyose	Tetrasaccharide

Question85

Which among the following α -amino acids does NOT have chiral carbon atom?

MHT CET 2023 10th May Morning Shift

Options:

- A. Histidine
- B. Glutamic acid
- C. Serine
- D. Glycine

Answer: D

Solution:

Except glycine, all α -amino acids are chiral.

Question86

Identify glycosidic linkage present in lactose.



MHT CET 2023 10th May Morning Shift

Options:

A. $\beta - 1, 2$

B. $\alpha - 1, 4$

C. $\beta - 1, 4$

D. $\beta - 1, 6$

Answer: C

Solution:

In lactose, the glycosidic linkage is formed between C-1 of β -D-galactose and C-4 of β -D-glucose.

Question87

Identify the carbon atoms of α -glucose and β -fructose forming glycosidic linkage in sucrose.

MHT CET 2023 9th May Evening Shift

Options:

A. C - 1 of β -fructose and C - 2 of α -glucose

B. C-1 of α -glucose and C - 2 of β -fructose

C. C - 1 of α -glucose and C - 1 of β -fructose

D. C - 2 of α -glucose and C-2 of β -fructose

Answer: B

Solution:



Structure of sucrose contains glycosidic linkage between C – 1 of α -glucose and C – 2 of β -fructose. Aldehyde and ketone groups of both the monosaccharide units are involved in formation of the glycosidic bond.

Question88

Identify the trisaccharide from following.

MHT CET 2023 9th May Evening Shift

Options:

- A. Maltose
- B. Lactose
- C. Raffinose
- D. Stachyose

Answer: C

Solution:

Maltose, lactose - Disaccharides

Raffinose - Trisaccharides

Stachyose - Tetrasaccharides

Question89

Which carbon atoms (numbered from C_1 to C_6) are involved in the formation of ring structure of glucose?

MHT CET 2023 9th May Morning Shift

Options:

A. C₂ and C₅

B. C₁ and C₃

C. C₁ and C₄

D. C₁ and C₅

Answer: D

Solution:

The ring structure of glucose is formed by reaction between the formyl ($-\text{CHO}$) group (C-1) and the alcoholic ($-\text{OH}$) group at C-5.

Question90

What is the value of specific rotation exhibited by glucose molecule?

MHT CET 2023 9th May Morning Shift

Options:

A. $+52.7^\circ$

B. -92.4°

C. $+66.5^\circ$

D. $+40.3^\circ$

Answer: A

Solution:

The specific rotation of a glucose molecule is a measure of the degree to which it rotates the plane of polarized light. The specific rotation for glucose is :

Option A : $+52.7^\circ$

This value is typical for the D-form of glucose (dextrose) in solution at a standard temperature and wavelength.

Question91

Which nitrogen atom of pyrimidine base numbered from 1 to 6 is bonded with furanose sugar ?

MHT CET 2022 11th August Evening Shift

Options:

- A. 4
- B. 2
- C. 1
- D. 5

Answer: B

Solution:

2nd nitrogen atom of pyrimidine base is bonded to furanose sugar.

Question92

Which of the following is an aldohexose?

MHT CET 2021 24th September Evening Shift

Options:

- A. Ribose
- B. Glucose
- C. Fructose
- D. Threose

Answer: B

Solution:

To determine which of the given options is an aldohexose, let's first define what an aldohexose is:

An aldohexose is a type of monosaccharide that contains six carbon atoms (making it a hexose) and has an aldehyde group (making it an aldose). The general formula for an aldohexose is $C_6H_{12}O_6$, and it includes an aldehyde group at the first carbon atom.

Now, let's analyze each option to see which fits this definition:

Option A: Ribose

Ribose is a pentose sugar, meaning it has only five carbon atoms. Its chemical formula is $C_5H_{10}O_5$. Ribose is classified as an aldopentose because it has an aldehyde group but only five carbons.

Option B: Glucose

Glucose is indeed an aldohexose. It has six carbon atoms, and its chemical formula is $C_6H_{12}O_6$. Moreover, it has an aldehyde group at the first carbon atom.

Option C: Fructose

Fructose is a hexose sugar with the chemical formula $C_6H_{12}O_6$. However, it is classified as a ketohexose because it contains a ketone group instead of an aldehyde group.

Option D: Threose

Threose is a tetrose sugar, meaning it has only four carbon atoms. Its chemical formula is $C_4H_8O_4$. Threose is an aldotetrose because it has an aldehyde group but only four carbons.

Based on this analysis, the correct option is:

Option B: Glucose

Question93

Which of the following is a correct bridged name of deoxyriboseadenosine monophosphate?

MHT CET 2021 24th September Evening Shift

Options:

A. AMP

B. dAMP



C. dTMP

D. UMP

Answer: B

Solution:

To determine the correct bridged name of deoxyriboseadenosine monophosphate, it's important to break down the components of the name and understand them individually:

1. **Deoxyribose:** This refers to a sugar molecule that lacks one oxygen atom compared to ribose. "d" in nucleotide names stands for deoxyribose.
2. **Adenosine:** This is a nucleoside composed of the nucleobase adenine attached to a ribose sugar. However, in the case of deoxyribose, it is attached to a deoxyribose sugar.
3. **Monophosphate:** This indicates the presence of a single phosphate group attached to the molecule.

From these components, we want to identify the name that incorporates deoxyribose, adenosine, and a phosphate group. Let's analyze each option:

Option A: AMP

AMP stands for adenosine monophosphate. This contains adenine, ribose, and one phosphate group but does not indicate the presence of deoxyribose.

Option B: dAMP

dAMP stands for deoxyadenosine monophosphate. "d" indicates the presence of deoxyribose instead of ribose, adenine as the base, and one phosphate group. This matches our requirement for deoxyriboseadenosine monophosphate.

Option C: dTMP

dTMP stands for deoxythymidine monophosphate. This includes thymine, deoxyribose, and one phosphate group, which does not match our requirement as the nucleobase should be adenine, not thymine.

Option D: UMP

UMP stands for uridine monophosphate. This includes uracil, ribose, and one phosphate group, which is not relevant since it doesn't include deoxyribose or adenine.

Hence, the correct bridged name for deoxyriboseadenosine monophosphate is:

Option B: dAMP

Question94

Identify basic α -amino acid from following.



MHT CET 2021 24th September Morning Shift

Options:

- A. Alanine
- B. Lysine
- C. Asparagine
- D. Glycine

Answer: B

Solution:

Lysine is basic α -amino acid while others are neutral α -amino acids.

Question95

Which from following reagents is used to identify straight chain of glucose?

MHT CET 2021 24th September Morning Shift

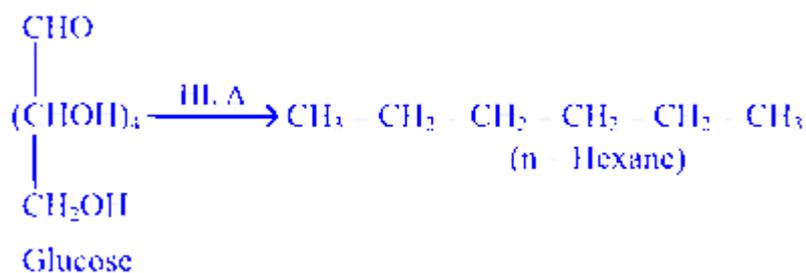
Options:

- A. HI
- B. dil. HNO_3
- C. HCN
- D. Acetic anhydride

Answer: A

Solution:

On prolonged heating with HI, it forms n-hexane, suggesting that all the six carbon atoms are linked in a straight chain.



Question96

The units of monosaccharides present in raffinose are

MHT CET 2021 23rd September Evening Shift

Options:

- A. Two Galactose and one Fructose
- B. Two Fructose and one Glucose
- C. Two Glucose and one Fructose
- D. Glucose, Fructose and Galactose (one unit of each)

Answer: D

Solution:

Raffinose is a **trisaccharide** made of **one unit each of** :

- Galactose
- Glucose
- Fructose

So the correct option is **D: Glucose, Fructose and Galactose (one unit of each)** .

Question97

Identify the protein present in nail.

MHT CET 2021 23rd September Evening Shift

Options:

A. Albumin

B. Keratin

C. Myosin

D. Legumelin

Answer: B

Solution:

The correct answer is **Option B: Keratin**. Here's why:

Keratin is a fibrous protein that is the primary component of nails, hair, and skin. It provides strength, flexibility, and protection to these structures.

Let's look at why the other options are incorrect:

Option A: Albumin is a globular protein found in blood plasma. It is primarily involved in maintaining blood volume and pressure.

Option C: Myosin is a protein found in muscle fibers. It is responsible for muscle contraction.

Option D: Legumelin is a protein found in legumes, such as beans and peas. It has various functions related to seed development and storage.

Question98

Which of following is used for synthesis of adipic acid enzymatically by Drath and Frost?

MHT CET 2021 23rd September Evening Shift

Options:

- A. Benzene
- B. Glucose
- C. Fructose
- D. Galactose

Answer: B

Solution:

Draths and Frost developed an **enzymatic/biocatalytic route to adipic acid starting from glucose** (via engineered metabolic pathways).

Correct option: B) Glucose

Question99

Identify the sugar containing $\alpha, \beta - 1, 2$ -glycosidic linkage.

MHT CET 2021 23th September Morning Shift

Options:

- A. Sucrose
- B. Maltose
- C. Lactose
- D. Raffinose

Answer: A

Solution:

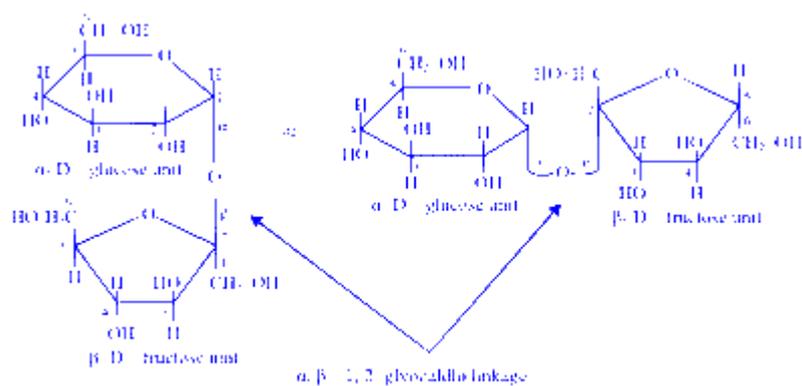


Fig. Haworth formula of sucrose

Question100

Which of the following compound is obtained when glucose is treated with dilute nitric acid?

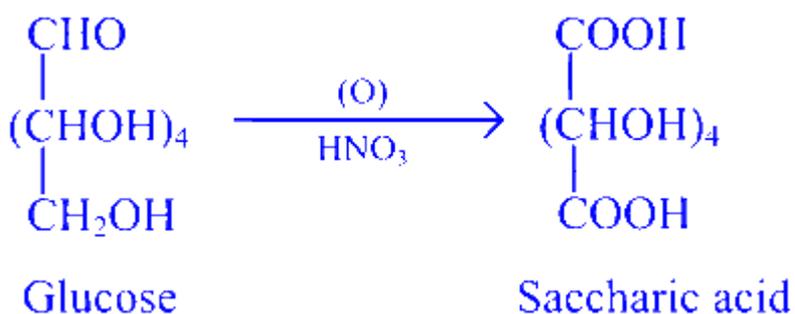
MHT CET 2021 23th September Morning Shift

Options:

- A. Glucose oxime
- B. Gluconic acid
- C. Saccharic acid
- D. Glucose cyanohydrin

Answer: C

Solution:



Question101

Which among the following is a double ring containing nitrogen base present in nucleic acids?

MHT CET 2021 22th September Evening Shift

Options:

- A. Thymine
- B. Adenine
- C. Cytosine
- D. Uracil

Answer: B

Solution:

The correct answer is Option B, Adenine. Adenine is one of the purine bases found in nucleic acids - DNA and RNA. Purines are characterized by a double-ring structure that contains nitrogen atoms. Specifically, the purine ring system consists of a six-membered and a five-membered nitrogen-containing ring, fused together.

In contrast, the other options provided represent pyrimidines (Thymine, Cytosine, and Uracil), which are characterized by a single six-membered ring that contains nitrogen atoms.

Summary:

- Adenine (Purine) has a double-ring structure and is found in both DNA and RNA.
- Thymine (Pyrimidine) has a single-ring structure and is found only in DNA.
- Cytosine (Pyrimidine) has a single-ring structure and is found in both DNA and RNA.
- Uracil (Pyrimidine) has a single-ring structure and is found only in RNA, replacing Thymine as the complementary base to Adenine.

Question102

Identify the reagent R used in following conversion.



Glucose \xrightarrow{R} n - hexane

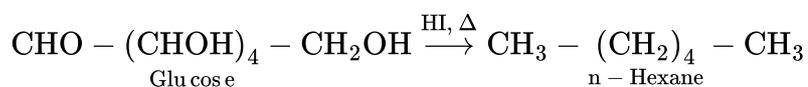
MHT CET 2021 22th September Evening Shift

Options:

- A. HI, Δ
- B. NH_2OH
- C. HCN
- D. HNO_3

Answer: A

Solution:



Question103

Which is C-terminal residue in glycyl alanine?

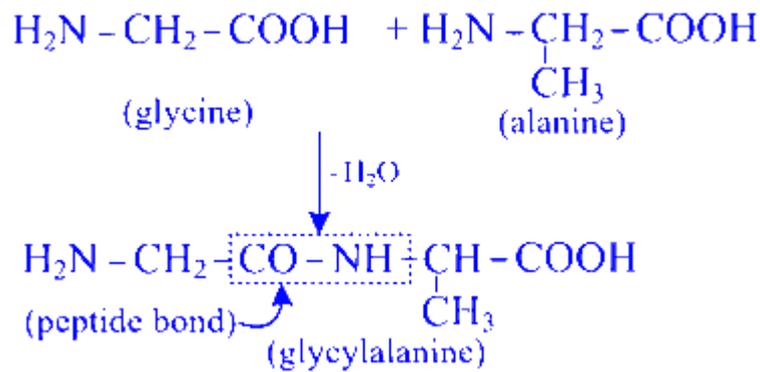
MHT CET 2021 22th September Morning Shift

Options:

- A. Alanine
- B. Glutamine
- C. Arginine
- D. Glycine

Answer: A

Solution:



In the dipeptide glycylalanine, glycine residue is N-terminal and alanine residue is C-terminal.

Question104

Identify N and C terminal of α -amino acid respectively in following polypeptide fragment. Ala-Gly-Ser-Tyr-Gly

MHT CET 2021 22th September Morning Shift

Options:

- A. Gly and Tyr
- B. Gly and Gly
- C. Ala and Ser
- D. Ala and Gly

Answer: D

Solution:

In a polypeptide chain, the N-terminal refers to the end of the chain where the amino group ($-\text{NH}_2$) is free, while the C-terminal refers to the end of the chain where the carboxyl group ($-\text{COOH}$) is free.



The given polypeptide fragment is Ala-Gly-Ser-Tyr-Gly. To identify the N and C terminals, we need to look at the orientation of the chain. By convention, the sequence is written from the N-terminal to the C-terminal.

The first amino acid in the sequence is Alanine (Ala), which has a free amino group ($-NH_2$). Thus, Alanine is at the N-terminal.

The last amino acid in the sequence is Glycine (Gly), which has a free carboxyl group ($-COOH$). Therefore, Glycine is at the C-terminal.

Therefore, the correct answer is:

Option D: Ala and Gly

Question105

Which of following enzymes is useful in conversion of glucose to fructose?

MHT CET 2021 21th September Evening Shift

Options:

- A. Invertase
- B. Glucose isomerase
- C. Amylase
- D. Proteases

Answer: B

Solution:

Glucose isomerase is useful in conversion of glucose to sweet-tasting fructose.

Question106

Which reagent oxidizes glucose to saccharic acid?

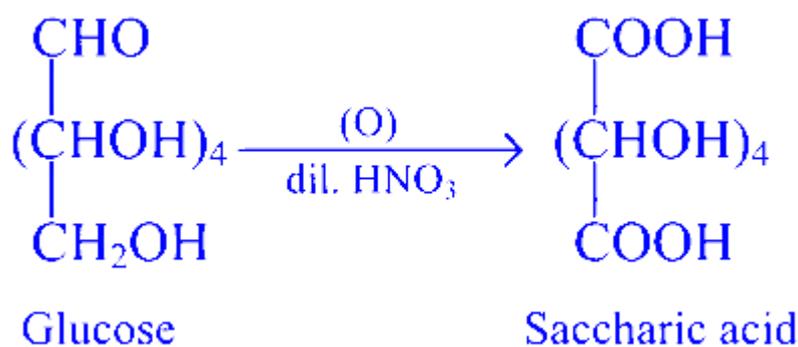
MHT CET 2021 21th September Evening Shift

Options:

- A. dil. HNO₃
- B. NH₂OH
- C. HCN
- D. Br₂ water

Answer: A

Solution:



Question107

Identify the hydrolysis product of starch.

MHT CET 2021 21th September Morning Shift

Options:

- A. Glucose
- B. Fructose
- C. Galactose

D. Ribose

Answer: A

Solution:

Starch is a polymer of α -D-glucose.

Question108

Which carbon atom of ribose sugar is joined to nitrogen base to form nucleoside?

MHT CET 2021 21th September Morning Shift

Options:

A. C – 2'

B. C – 5'

C. C – 3'

D. C – 1'

Answer: D

Solution:

In a **nucleoside**, the **nitrogenous base** is attached to the **C-1' carbon** of the ribose (or deoxyribose) sugar via an **N-glycosidic bond**.

Correct answer: D) C-1'

Question109

Glucose and gluconic acid on oxidation with dilute nitric acid forms saccharic acid. This reaction confirms that glucose contains

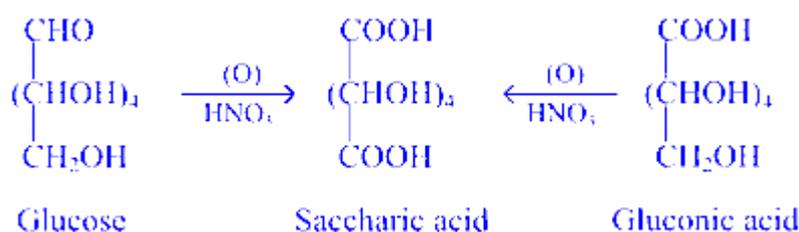
MHT CET 2021 20th September Evening Shift

Options:

- A. four primary alcoholic groups.
- B. two primary alcoholic groups.
- C. one primary alcoholic groups.
- D. five hydroxyl groups.

Answer: C

Solution:



This confirms the presence of one primary alcoholic groups ($-\text{CH}_2\text{OH}$) in glucose.

Question110

Which among the following carbohydrates is a trisaccharide?

MHT CET 2021 20th September Evening Shift

Options:

- A. Ribose
- B. Raffinose
- C. Glycogen
- D. Stachyose

Answer: B

Solution:



Question111

Identify the glycosidic linkage present in lactose.

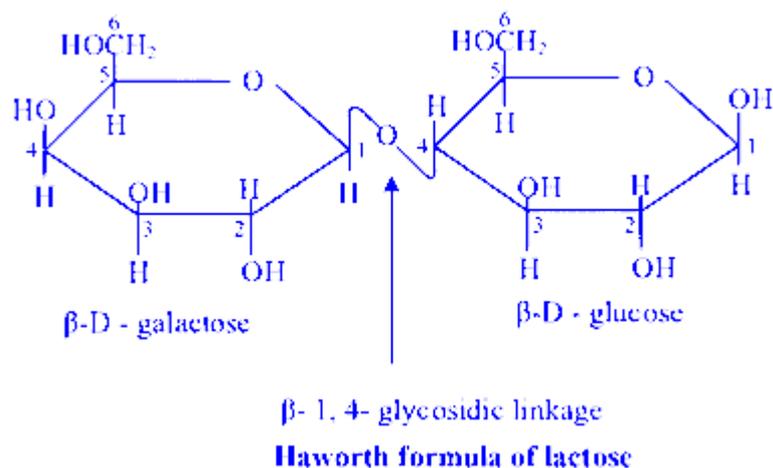
MHT CET 2021 20th September Morning Shift

Options:

- A. $\alpha - 1, 6$
- B. $\alpha - 1, 4$
- C. $\beta - 1, 4$
- D. $\alpha, \beta - 1, 2$

Answer: C

Solution:



Question112

Which of the following sugar is found in milk?

MHT CET 2021 20th September Morning Shift

Options:

- A. Sucrose
- B. Maltose
- C. Lactose
- D. Fructose

Answer: C

Solution:

The sugar found in milk is **lactose** (milk sugar).

Correct answer: C) Lactose

Question113

Identify the enzyme X in the following reaction



MHT CET 2020 19th October Evening Shift

Options:

- A. Catalase
- B. Ferroxidase



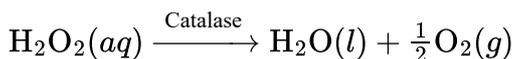
C. Amylase

D. Carbonic anhydrase

Answer: A

Solution:

Catalase enzyme used in this reaction.



It is a common enzyme found in nearly all living organism exposed to oxygen, which catalyses the decomposition of hydrogen peroxide (H_2O_2) to water and oxygen. It is a very important enzyme in protecting the cell from oxidative damage by reactive oxygen species.

Question114

Which reagent among the following is used to confirm presence of aldehydic carbonyl group in glucose?

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Options:

A. Dilute nitric acid

B. Bromine water

C. Acetic anhydride

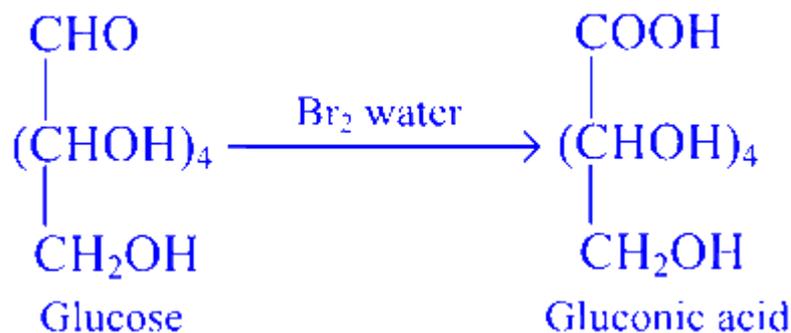
D. Hydroxylamine

Answer: B

Solution:

Bromine water is used to confirm presence of aldehydic carbonyl group in glucose.





Glucose gets oxidised to six carbon carboxylic acid (gluconic acid) on reaction with a mild oxidising agent (Br₂ water).

Question115

Which carbon atoms of $\alpha - D$ glucopyranose and β -D-fructofuranose respectively are linked together to form glycosidic linkage in sucrose?

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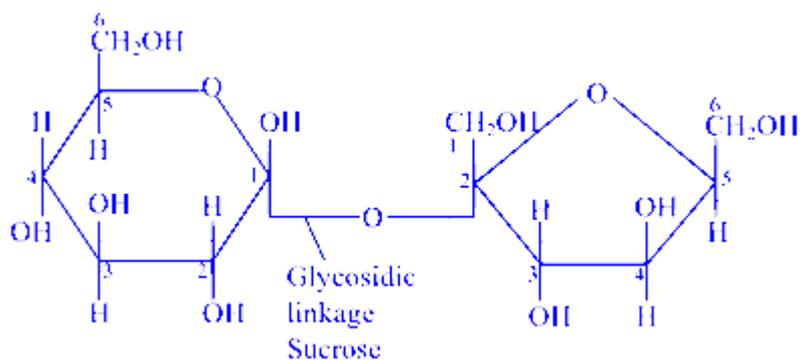
Options:

- A. C-2 of α -D-glucopyranose and C - 2 of β - D fructofuranose
- B. C-1 of α -D-glucopyranose and C - 2 of β -D fructofuranose
- C. C-1 of α -D-glucopyranose and C – 6 of β -D fructofuranose
- D. C-2 of α -D-glucopyranose and C – 3 of β -D fructofuranose?

Answer: B

Solution:

C-1 of α -D-glucopyranose and C-2 and β -D-fructofuranose respectively are linkage together to form glycosidic linkage in sucrose. It is shown below:



Question116

Which among the following compounds is obtained when glucose react with hydrogen cyanide?

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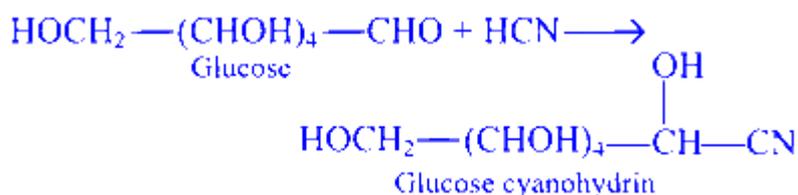
Options:

- A. Gluconic acid
- B. Glucose cyanohydrin
- C. Saccharic acid
- D. *n*-hexane

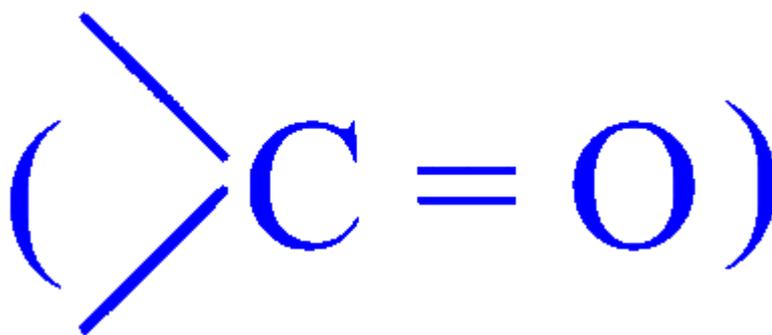
Answer: B

Solution:

Glucose react with hydrogen cyanide to form glucose cyanohydrin.



This reaction confirm the presence of a carboxyl group



in glucose.

Question 117

Which is the product obtained, when Br_2 water reacts with glucose?

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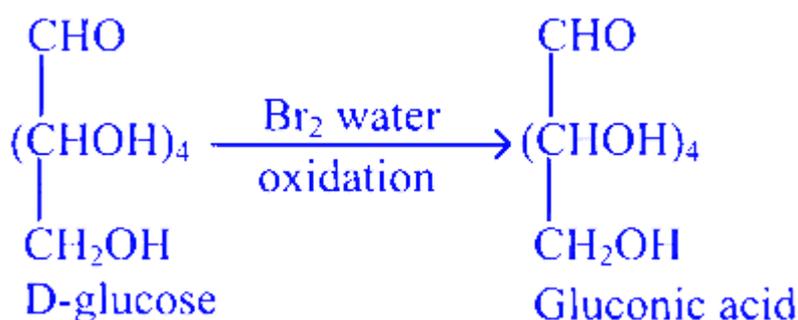
Options:

- A. 1,6-dibromo glucose
- B. Saccharic acid
- C. Gluconic acid
- D. Bromohexane

Answer: C

Solution:

When Br_2 water reacts with glucose than it forms gluconic acid.



On reaction with Br_2 water, glucose gets oxidised to six carbon carboxylic acid. This indicates that the carbonyl group present, is an aldehydic group.

Question118

Which among the following compounds belongs to lipids?

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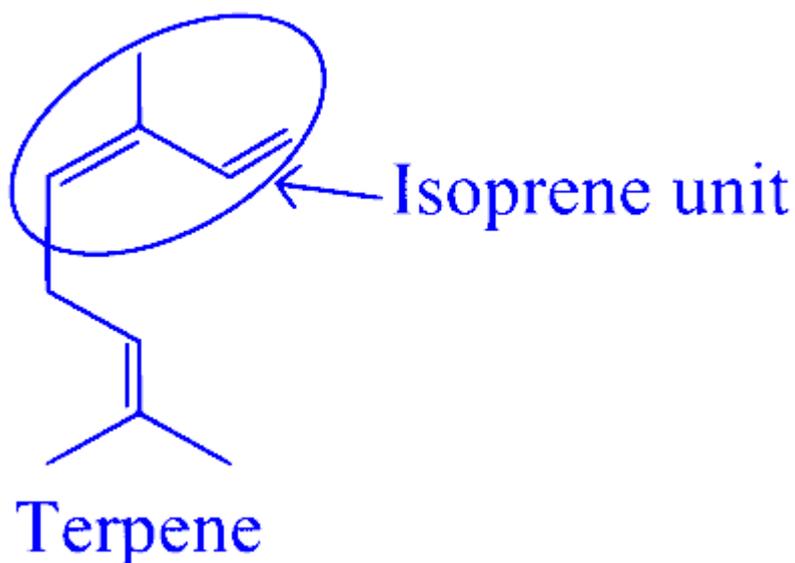
Options:

- A. BHA
- B. Novestrol
- C. Terpenes
- D. Cloroxylenol

Answer: C

Solution:

Terpenes, belongs to lipids. These are built up from isoprene. This hydrocarbon consisting of five carbon atoms attached to eight hydrogen atoms (C_5H_8).



Question119



Identify the enzyme that catalyses the reaction of CO₂ with water in human body.

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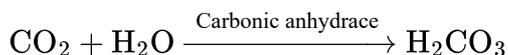
Options:

- A. Carbonic anhydrase
- B. Ferroxidase
- C. Nitrogenase
- D. Catalase

Answer: A

Solution:

Carbonic anhydrase enzyme catalyses the reaction of CO₂ with water in human body. It is found within red blood cells, catalyses a reaction converting CO₂ and water into carbonic acid, which dissociates into protons and bicarbonate ions.



This involves the transfer of CO₂ from tissues to the lungs via the blood stream.

Question120

Which among the following amino acids has lowest molar mass?

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Options:

- A. Arginine
- B. Aspartic acid
- C. Asparagine

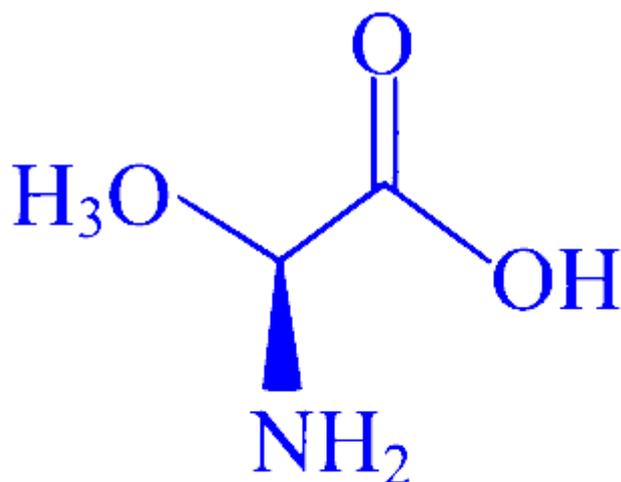


D. Alanine

Answer: D

Solution:

Alanine has lowest molecular mass with chemical formula $C_3H_7NO_2$. Alanine is the simplest α -amino acid after glycine. The methyl side chain of alanine is non-reactive and is therefore hardly ever directly involved in protein function.



Alanine

(Molar mass = 89.09g/mol)

Question121

Which among the following type of linkages is present in cellulose?

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Options:

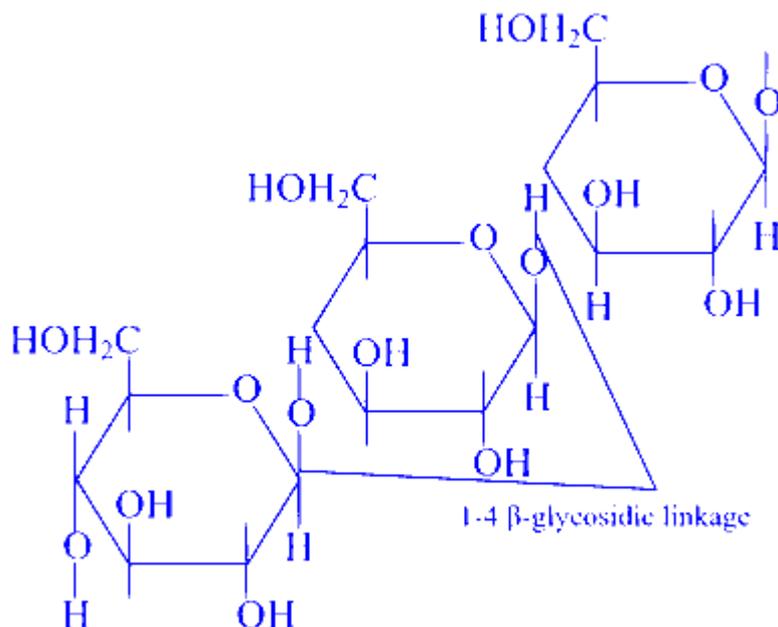
- A. 1 → 6 β -glycosidic linkages
- B. 1 → 4 α -glycosidic linkages
- C. 1 → 6 α -glycosidic linkages
- D. 1 → 4 β -glycosidic linkages



Answer: D

Solution:

1 \rightarrow 4 β -glycosidic linkage is present in cellulose. It is the main constituent of cell wall of plant cells. It is straight chain polysaccharide composed only of β -D glucose units that are linked together by glycosidic linkage between C-1 of one glucose unit and C-4 of the next glucose unit.



Question122

The vitamin that belongs to aromatic series is

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Options:

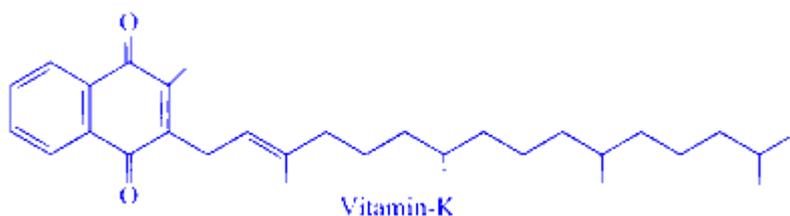
- A. B complex
- B. K
- C. C
- D. A

Answer: B

Solution:



The vitamin that belongs to aromatic series is vitamin K. It has an aromatic structure. The structure of vitamin K is given below:



Question123

Which of the following is not present in DNA?

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Options:

- A. Thymine
- B. Guanine
- C. Adenine
- D. Uracil

Answer: D

Solution:

Uracil is not present in DNA. It is present in RNA. DNA contains four bases, i.e. adenine (*A*), guanine (*G*), cytosine (*C*), and thymine (*T*). In RNA, thymine (*T*) is replaced by uracil (*U*).

Question124

Which of the following molecules form a Zwitter ion?

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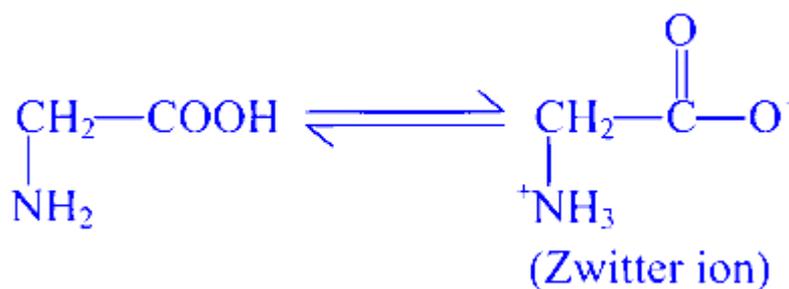
Options:

- A. $\text{CH}_3\text{COOCH}_3$
- B. $\text{H}_2\text{NCH}_2\text{COOH}$
- C. $\text{CH}_3\text{COC}_2\text{H}_5$
- D. $\text{CH}_3\text{CH}_2\text{COOH}$

Answer: B

Solution:

Zwitter ion is a molecule containing a positively charged ion at one end and a negatively charged ion at the other. Among the given compounds amino acid, $\text{H}_2\text{NCH}_2\text{COOH}$ forms a Zwitter ion which is shown below.



Question125

The enzyme which converts maltose to glucose is

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Options:

- A. maltase
- B. insulin
- C. lysine
- D. zymase

Answer: A



Solution:

The enzyme which converts maltose to glucose is maltase. During digestion, starch is partially transformed into maltose by pancreatic or salivary enzymes called amylases; maltase secreted by the intestine then converts maltose into glucose. The glucose so produced is either utilised by the body or stored in the liver as glycogen.

Question126

How many isoprene units are present in abscisic acid?

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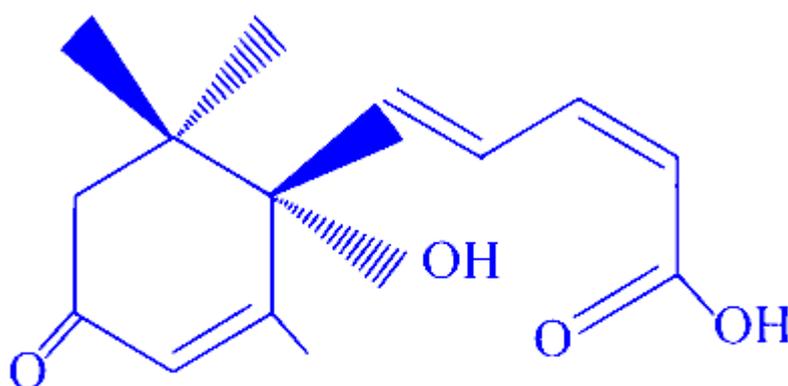
Options:

- A. Three
- B. Two
- C. Four
- D. Five

Answer: A

Solution:

Abscisic acid with molecular formula $C_{15}H_{20}O_4$ is composed of three isoprene units. The structure of abscisic acid is shown below:



Abscisic acid



Question127

β -pleated sheets of polypeptide chains are present in

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Options:

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

Answer: A

Solution:

β -pleated sheets of polypeptide chains are present in the secondary structure of proteins. All peptide chains are stretched out to nearly maximum extension and then laid side by side which are held together by intermolecular hydrogen bonds.

