Biomolecules

Question1

Which of the following do not reduce Tollen's reagent?

(A) Fructose

(B) Sucrose

(C) Lactose

(D) Cellulose

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Options:

A.

A, B

B.

B, D

C.

A, C

D.

C, D

Answer: B

Solution:

Sucrose and cellulose does not reduces Tollen's reagent. This is because they lack free aldehyde or ketone group necessary for the reaction.

Question2

Consider the following

Statement-I Lysine, arginine are essential and basic amino acids.

Statement-II Leucine, phenylalanine are non essential and neutral amino acids.

Correct answer is

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Options:

A.

Both statement-I and statement-II are correct.

B.

Both statement-I and statement-II are not correct.

C.

Statement-I is correct, but statement-II is not correct.

D.

Statement-I is not correct, but statement-II is correct.

Answer: C

Solution:

Statement-I: Lysine, arginine are essential and basic amino acids.

- **Essentiality:** Lysine is an essential amino acid, meaning the human body cannot synthesize it and it must be obtained from the diet. Arginine is often considered a conditionally essential amino acid (essential during growth, pregnancy, or illness) but is frequently grouped with essential amino acids in general contexts.

- **Basicity:** Basic amino acids have an extra amino group or other basic group in their side chain, which is protonated and positively charged at physiological pH.
    - Lysine has a primary amino group (-NH2) at the end of its side chain.
    - Arginine has a guanidinium group in its side chain.

  Both are indeed basic amino acids.

  Therefore, Statement-I is **correct**.

Statement-II: Leucine, phenylalanine are non essential and neutral amino acids.

- **Essentiality:**
    - Leucine is one of the nine essential amino acids.
    - Phenylalanine is also an essential amino acid.

  Thus, the claim that they are "non-essential" is **incorrect**.

- **Neutrality:**
    - Leucine has an aliphatic, nonpolar side chain, making it a neutral amino acid.
    - Phenylalanine has an aromatic, nonpolar side chain, making it a neutral amino acid.

  Thus, the claim that they are "neutral amino acids" is correct.

Since the first part of the statement (non-essential) is incorrect, Statement-II as a whole is **not correct**.

Conclusion:

Statement-I is correct.

Statement-II is not correct.

This corresponds to Option C.

The final answer is $\boxed{C}$

Question3

Which of the following enzymatic reaction is not correctly matched with enzyme shown against it in brackets?

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Options:

A.

Proteins → Peptides (pepsin)

B.

Starch → Maltose (Zymase)

C.

Sucrose → Glucose and Fructose (Invertase)

D.

Maltose → Glucose (Maltase)

Answer: B

Solution:

Enzymetic reaction given in option (b) is incorrect for conversion of starch to maltose. The correct form is,

$$\text{Starch} \xrightarrow{\text{Amylase}} \text{Maltose}$$

Question4

Identify the essential amino acids from the following

I. Leucine

II. Tyrosine

III. Cysteine

IV. Histidine

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Options:

A.

I and II only

B.

II and III only

C.

II and IV only

D.

I and IV only

Answer: D

Solution:

Essential amino acid : Leucine and Histidine

Non essential amino acid : Tyrosine and cysteine.

Essential are those which human body does not produce and vice-versa.

Question5

Which of the following represents nucleoside of RNA?

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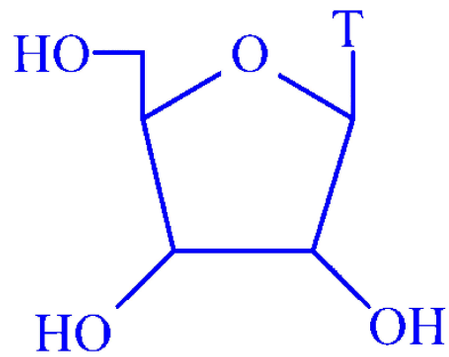
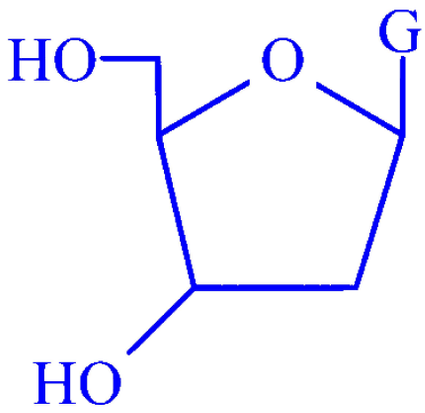
Options:

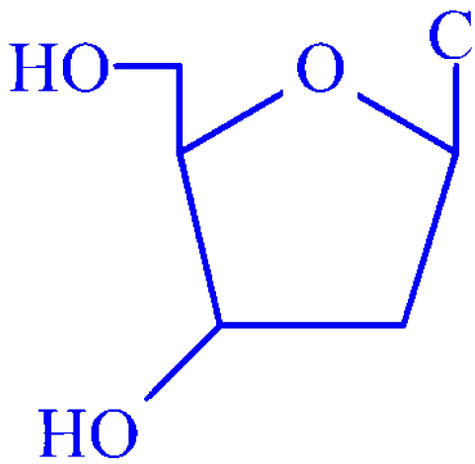
A.



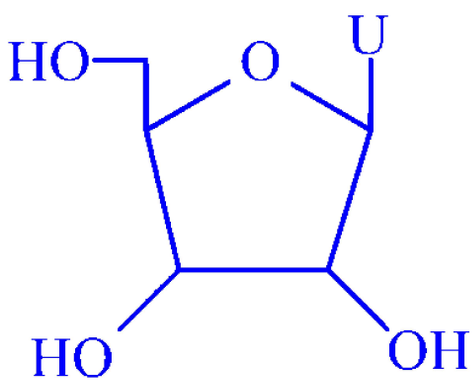
B.



C.



D.

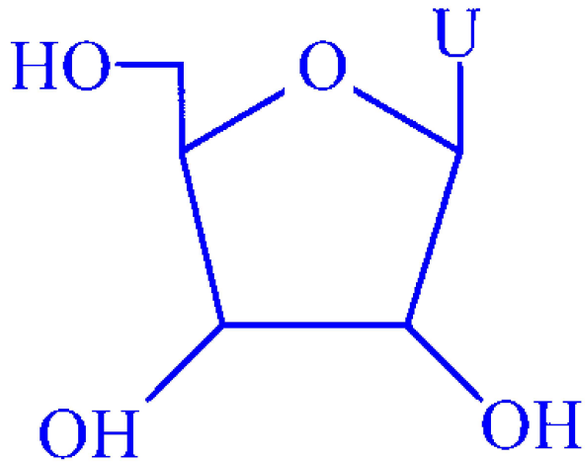


Answer: D

Solution:

A nucleoside of RNA is composed of a nitrogenous base (like uracil adenine, cytosine or guanine) attached to a ribose sugar molecules.

The correct structure is



Question6

Match the following

List-I (Glycosidic linkage)		List-II (Polysaccharide)	
(A)	$\alpha-1,4$	(I)	Amylose
(B)	$\beta-1,4$	(II)	Amylopectin
(C)	$\alpha-1,4, \alpha-1,6$	(III)	Cellulose

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Options:

A.

A-II, B-I, C-III

B.

A-III, B-I, C-II

C.

A-I, B-II, C-III

D.

A-I, B-III, C-II

Answer: D

Solution:

1. **Amylose**:
    - Amylose is a linear polymer made up of D-glucose units.
    - The glucose units are linked together by **α-1,4-glycosidic bonds**.
2. **Amylopectin**:
    - Amylopectin is a branched polymer of D-glucose units.
    - The linear chains are formed by **α-1,4-glycosidic bonds**.
    - Branching occurs due to **α-1,6-glycosidic bonds** at intervals.
3. **Cellulose**:
    - Cellulose is a linear polymer of D-glucose units.
    - The glucose units are linked by **β-1,4-glycosidic bonds**. This type of linkage gives cellulose its rigid, structural properties.

Now, let's match List-I (Glycosidic linkage) with List-II (Polysaccharide):

- **(A) α-1,4**: This linkage is characteristic of the linear chains in both amylose and amylopectin. Since amylose *only* has α-1,4 linkages for its main structure, it's the most direct match here. So, **A - (I) Amylose**.
- **(B) β-1,4**: This linkage is unique to **(III) Cellulose** among the given options. So, **B - (III) Cellulose**.
- **(C) α-1,4, α-1,6**: The presence of both α-1,4 and α-1,6 linkages indicates a branched polysaccharide with alpha linkages, which is characteristic of **(II) Amylopectin**. So, **C - (II) Amylopectin**.

Therefore, the correct matching is:

- A - I
- B - III
- C - II

Question7

The list given below contains essential amino acids that are basic (X) and also non essential amino acids that are neutral (Y). X and Y, respectively are

I. Lysine

II. Alanine

III. Serine

IV. Arginine

V. Tyrosine

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Options:

A.

$X =$ II, III, IV; $Y =$ I, IV

B.

$X = I, IV; Y = II, III, V$

C.

$X = I$, III; $Y = II$, IV, V

D.

$X =$ I, II, III; $Y =$ IV, V

Answer: B

Solution:

The aminoacids, which can be synthesised in the body are called non-essential amino acid. While those amino acids which cannot be synthesised in the body must be obtained through diet. Thus, among the given amino acids.

Essential amino acid is $X =$ Lysine, Arginine, Non-essential amino acid is $Y =$ Alanine, Serine, Tyrosine

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Question8

Consider the following

Statement-I : Cane sugar is a disaccharide of α-D-glucose and β-D-fructose.

Statement-II : Milk sugar is a disaccharide of α-D-glucose and β-D-galactose.

The correct answer is

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Options:

A.

Both statement-I and statement-II are correct.

B.

Both statement-I and statement-II are not correct.

C.

Statement-I is correct, but statement-II is not correct.

D.

Statement-I is not correct, but statement-II is correct.

Answer: C

Solution:

Statement–I:

Cane sugar is a disaccharide of α-D-glucose and β-D-fructose.

- Cane sugar is **sucrose**.
- The structure of sucrose consists of **α-D-glucose** and **β-D-fructose** units joined by an α,β-1→2 glycosidic linkage.

✅ **Statement-I is correct.**

Statement–II:

Milk sugar is a disaccharide of α-D-glucose and β-D-galactose.

- Milk sugar is **lactose**.
- Lactose is composed of **β-D-galactose** and **β-D-glucose**, linked by a β-1→4 glycosidic bond.
- The glucose part in lactose is **β-D-glucose**, *not* α-D-glucose.

❌ **Statement-II is not correct.**

✅ **Final Answer:**

Option C:

Statement-I is correct, but Statement-II is not correct.

Question9

The deficiency of vitamin (X) causes convulsions. Source of X is Y. What are X and Y ?

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Options:

A.

Riboflavin, milk

B.

Riboflavin, fish

C.

Pyridoxine, curd

D.

Pyridoxine, cereals

Answer: D

Solution:

- **Convulsions** occur when there is an issue with the normal functioning of the nervous system.

- **Vitamin that prevents convulsions:** Pyridoxine (Vitamin B_6) is required for the synthesis of neurotransmitters such as GABA.

  Deficiency of Vitamin B_6 → decreased GABA formation → neuronal hyperexcitability → **convulsions**.

Now let's check the **source:**

- Vitamin B_6 (Pyridoxine) is found in **cereals**, pulses, nuts, and non-vegetarian foods.

✅ **Correct answer:**

X = Pyridoxine (Vitamin B_6)

Y = Cereals

Answer: Option D — Pyridoxine, cereals

Question10

Consider the following

Statement-I Primary structure of protein represents its constitution.

Statement-II α-Helix and β-pleated sheet structure of protein represent tertiary structure of it.

Correct answer is

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Options:

A.

Both statement-I and statement-II are correct

B.

Both statement-I and statement-II are not correct

C.

Statement-I is correct, but statement-II is not correct

D.

Statement-I is not correct, but statement-II is correct

Answer: C

Solution:

Statement I is correct, but statement II is not correct. The correct form is, α-Helix and β-pleated sheet structure of protein represent secondary structure of it.

Question11

Consider the following.

Statement I : Lactose is composed of α - D-glucose and β-D-glucose.

Statement II : Lactose is a reducing sugar.

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Options:

A.

Both Statement I and Statement II are not correct.

B.

Both Statement I and Statement II are correct.

C.

Statement I is correct, but Statement II is not correct.

D.

Statement I is not correct, but Statement II is correct.

Answer: D

Solution:

Statement I:

“Lactose is composed of α-D-glucose and β-D-glucose.”

🧠 **Recall:**

Lactose (milk sugar) is a disaccharide consisting of **β-D-galactose** and **β-D-glucose**, linked by a **β(1→4)** glycosidic bond:

$\beta\text{-D-Galactose} - (1 \rightarrow 4) - \beta\text{-D-Glucose}.$

Therefore, it is **not** composed of two glucose molecules — one of the units is galactose.

✅ **Hence, Statement I is incorrect.**

Statement II:

“Lactose is a reducing sugar.”

🧠 **Explanation:**

In lactose, the glucose unit still has a **free anomeric carbon** (the hemiacetal group), so it can undergo mutarotation and reduce Benedict’s or Fehling’s solution.

Thus, **lactose is a reducing sugar.**

✅ **Statement II is correct.**

✅ **Final Answer:**

Option D: Statement I is not correct, but Statement II is correct.

Question12

Match the following.

List-I (Hormones)		List-II (Functions)	
A.	Glucocorticoids	I.	In the control of menstrual cycle
B.	Mineralocorticoids	II.	Prepares the uterus for implantation of fertilised egg
C.	Progesterone	III.	Control the level of excretion of water and salt by the kidneys
D.	Estradiol	IV	Control the carbohydrate metabolism

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Options:

A.

A-II, B-III, C-IV, D-I

B.

A-IV, B-I, C-II, D-III

C.

A-IV, B-III, C-II, D-I

D.

A-IV, B-I, C-III, D-II

Answer: C

Solution:

A. Glucocorticoids →

They are secreted from the adrenal cortex (e.g., cortisol) and function mainly in **carbohydrate metabolism** (they increase blood glucose level).

✅ **A → IV (Control the carbohydrate metabolism)**

B. Mineralocorticoids →

Also from the adrenal cortex (e.g., aldosterone); they regulate **water and salt balance** through the kidneys.

✅ **B → III (Control the level of excretion of water and salt by the kidneys)**

C. Progesterone →

Secreted by the corpus luteum; **prepares the uterus for implantation** of the fertilized egg.

✅ **C → II (Prepares uterus for implantation of fertilised egg)**

D. Estradiol →

An estrogen that plays a key role in **the control of the menstrual cycle.**

✅ **D → I (In the control of menstrual cycle)**

✅ **Final Matching:**

A–IV, B–III, C–II, D–I

Correct Option: C

Question13

Which of the following contain α-D-glucose units?

I. Cane sugar

II. Milk sugar

III. Cellulose

IV. Amylose

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Options:

A.

I, IV

B.

I, II

C.

II, III

D.

III, IV

Answer: A

Solution:

Cane sugar and amylose contain α-D glucose unit. Milk sugar and cellulose contains β-D glucose unit.

Question14

Identify the set containing purine and pyrimidine base of DNA respectively.

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Options:

A.

Adenine, Uracil

B.

Cytosine, Guanine

C.

Thymine, Uracil

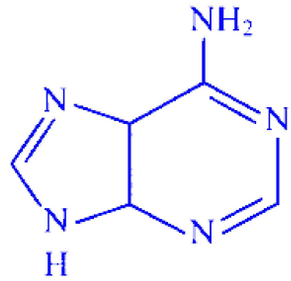
D.

Adenine, Cytosine

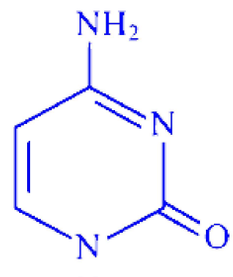
Answer: D

Solution:

Adenine and cytosine contains purine and pyrimidine base of DNA.



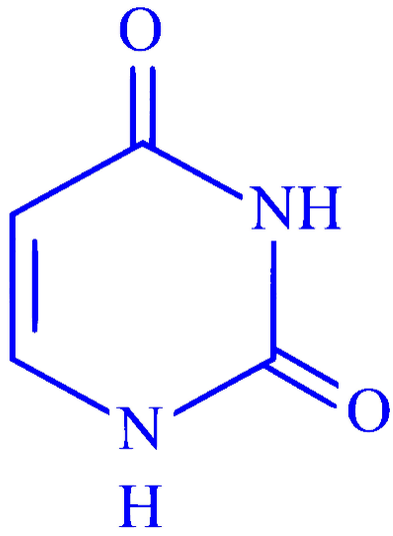
Adenine(A)



Cytosine (C)

Question15

The structure of the nitrogen containing heterocyclic base given below represents



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Options:

A.

thymine

B.

adenine

C.

cytosine

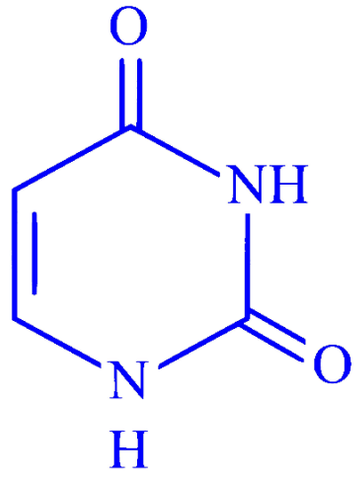
D.

uracil

Answer: D

Solution:

The given structure of uracil.



Question16

Observe the following reactions

I. Sucrose $(aq) + \mathrm{H_2O} \xrightarrow{x}$ **glucose + fructose**

II. Glucose $(aq) \xrightarrow{y}$ **ethanol** $+\mathrm{CO_2}$

What are x **and** y **respectively?**

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Options:

A.

Invertase, Zymase

B.

Zymase, Diastase

C.

Diastase, Zymase

D.

Diastase, Invertase

Answer: A

Solution:

(I) Hydrolysis of sucrose

Sucrose $(aq) + H_2O \xrightarrow{x}$ Glucose + fructose

Enzyme $x =$ Invertase

(II) Fermentation of glucose

Glucose $\xrightarrow{(y)}$ Ethanol $+CO_2$

Enzyme $y =$ Zymase

Question17

The incorrect statement about amylose is

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Options:

A.

it is water soluble.

B.

in this $\alpha - D - (+)$-glucose units are held by $C - 1$ to $C - 4$ glycosidic linkages.

C.

it is highly branched polymer of $\alpha - D - (+)$-glucose units.

D.

it is present in strach to an extent of $15 - 20\%$.

Answer: C

Solution:

The incorrect statements regarding amylose is, given in option (c). The correct form is,

Amylose is a linear not a highly branched polymer of α-D-(+)-glucose unit.

Question18

The improper functioning of ' X ' results in Addison's disease. Hormone ' Y ' is responsible for the development of secondary female characteristics. ' X ' and ' Y ' are respectively

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Options:

A.

adrenal cortex, estradiol

B.

adrenal cortex, progesterone

C.

thyroid, progesterone

D.

thyroid, estradiol

Answer: A

Solution:

The improper functioning of adrenal cortex (X) results in Addison's disease.

Estradiol (Y) hormone is responsible for the developments, of secondary female character.

Question19

Which of the following act as intracellular messengers?

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Options:

A. Enzymes

B. Hormones

C. Receptors

D. Carrier proteins

Answer: B

Solution:

Hormones act as intracellular messangers. Intracellular messanger also called as chemical messanger. It is because they are chemical agent that go around the body to tell particular cell to play a specific action.

Question20

The deficiency of vitamin (x) causes beri beri and deficiency of vitamin (y) causes convulsions.What are x and y respectively?

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Options:

A. B_2, B_{12}

B. B_2, B_6

C. B_1, B_{12}

D. B_1, B_6

Answer: D

Solution:

Vitamin deficiencies can lead to various health issues. Here's a brief explanation of two specific vitamin deficiencies:

Vitamin B_1 (Thiamine) Deficiency: A lack of vitamin B_1 can lead to a condition known as beriberi. This condition affects the cardiovascular and nervous systems, causing symptoms such as weakness, confusion, and difficulty breathing.

Vitamin B_6 (Pyridoxine) Deficiency: Insufficient vitamin B_6 can result in convulsions or seizures. This vitamin is crucial for neurotransmitter synthesis and proper brain function.

Thus, the deficiency of vitamin B_1 causes beriberi, and the deficiency of vitamin B_6 causes convulsions.

Question21

The number of -OH groups in open chain and ring structures of D-glucose are respectively

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Options:

A. 4,5

B. 5,5

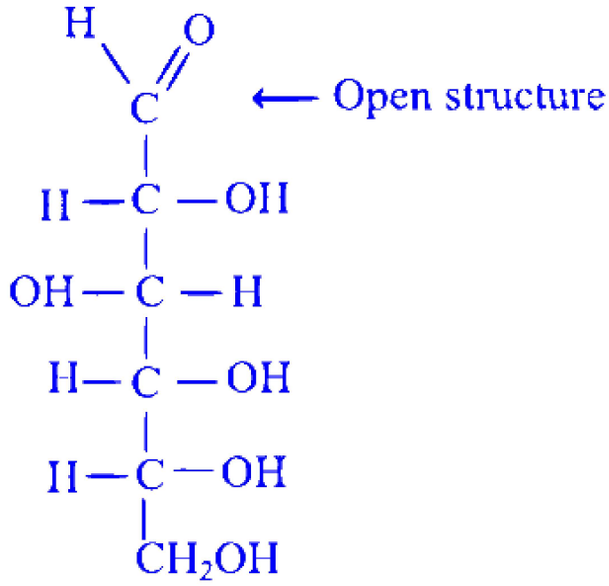
C. 5,4

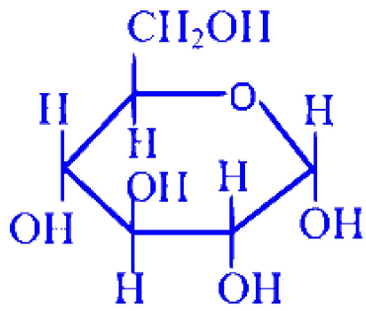
D. 6,5

Answer: B

Solution:

Five -OH group are present in 152 both open and closed (ring) structure of D-glucose.





Ring structure

Question22

Match List-I with List-II

List-I (Reaction)		List-II (Enzyme)	
A.	Hydrolysis of starch to maltose	I	Diastase
B	Chalcogen	II	Pepsin

List-I (Reaction)		List-II (Enzyme)	
C	Hydrolysis of sucrose to glucose and fructose	III	Invertase
D	Glucose to ethanol	IV	Zymase

The correct answer is

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Options:

A. A-III, B-II, C-I, D-IV

B. A-I, B-III, C-II, D-IV

C. A-IV, B-II, C-III, D-I

D. A-I, B-III, C-III, D-IV

Answer: D

Solution:

A. Hydrolysis of starch to maltose: This reaction is catalyzed by the enzyme **Diastase**. So, A matches with I.

B. [This entry appears to be unrelated to enzymes and reactions. It seems to be mistakenly included. Therefore, we will skip it.]

C. Hydrolysis of sucrose to glucose and fructose: This process is facilitated by the enzyme **Invertase**. Thus, C corresponds to III.

D. Glucose to ethanol: The enzyme responsible for this conversion is **Zymase**. Hence, D matches with IV.

Based on these matches:

A - I

C - III

D - IV

Therefore, the correct answer is **Option D: A-I, C-III, D-IV**.

Question23

Which of the following is not an essential amino acid ?

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Options:

A. Lysine

B. Histidine

C. Glutamine

D. Methionine

Answer: C

Solution:

The correct answer is Option C: Glutamine.

Essential amino acids are those that the body cannot produce in sufficient quantities on its own, so they must be obtained from the diet. Here's a quick breakdown of the options:

Lysine: An essential amino acid.

Histidine: Generally considered essential, especially in growing individuals.

Methionine: An essential amino acid.

Glutamine: Although very important for many functions (e.g., muscle recovery, immune function), it is non-essential because the human body can synthesize it.

Thus, Option C, Glutamine, is not an essential amino acid.

Question24

Which one of the following is NOT a disaccharide?

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Options:

A. Sucrose

B. Fructose

C. Maltose

D. Lactose

Answer: B

Solution:

Fructose is not a disaccharide.

A disaccharide is a type of sugar that forms when two monosaccharides join together through a glycosidic linkage. Fructose, on the other hand, is a monosaccharide, meaning it is a single sugar molecule and not composed of two units like disaccharides are.

Question25

Which of the following molecules contain sulphur atom in their structures?

I. Morphine

II. Heroin

III, Penicillin

IV. Terpineol

V. Cimetidine

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Options:

A. I, IV

B. III, III

C. III, V

D. IV, V

Answer: C

Solution:

Penicillin and cimetidine contain sulphur.

Name	Chemical formula
Morphine	$C_{17}H_{19}NO_3$
Heroin	$C_{21}H_{23}NO_5$
Penicillin	$C_{16}H_{18}N_2O_4S$
Terpineol	$C_{10}H_{18}O$
Cimetidine	$C_{10}H_{10}N_6S$

Question26

Identify the correctly matched set from the following.

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Options:

A. Vitamin A - water soluble - xerophthalmia

B. Vitamin B_6 - water soluble - scurvy

C. Vitamin D - fat soluble - rickets

D. Vitamin C - fat soluble - convulsions

Answer: C

Solution:

Let's analyze each option:

Option A: Vitamin A is a fat-soluble vitamin, not water-soluble. Its deficiency can lead to xerophthalmia, which is correct, but the solubility is mismatched.

Option B: Vitamin B_6 is water-soluble, but its deficiency does not cause scurvy. Scurvy is actually due to a deficiency of Vitamin C.

Option C: Vitamin D is a fat-soluble vitamin, and its deficiency can lead to rickets. This set is correctly matched.

Option D: Vitamin C is water-soluble, not fat-soluble, and its deficiency leads to scurvy. Also, convulsions are not typically associated with Vitamin C deficiency.

Thus, the correctly matched set is:

Option C: Vitamin D - fat soluble - rickets.

Question27

Given below are two statements.

I. Cytosine and guanine are formed in equal quantities in DNA hydrolysis.

II. Adenine and uracil are formed in equal quantities in RNA hydrolysis.

The correct answer is

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Options:

A. Both Statement I and Statement II are correct.

B. Both Statement I and Statement II are incorrect.

C. Statement I is correct but Statement II is incorrect.

D. Statement I is incorrect and Statement II is correct.

Answer: C

Solution:

For statement I: In double-stranded DNA, according to Chargaff's rules, the number of cytosine (C) bases is equal to the number of guanine (G) bases. This is because C pairs with G. Therefore, when DNA is hydrolyzed, cytosine and guanine are released in equal quantities.

For statement II: RNA is typically single-stranded and does not follow the strict base pairing rules found in DNA. Thus, the relationship between adenine (A) and uracil (U) in RNA is not necessarily one of equal quantities.

Based on this analysis:

Statement I is correct.

Statement II is incorrect.

So, the correct answer is Option C: Statement I is correct but Statement II is incorrect.

Question28

Which of the following structure of proteins represellis its constitution?

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Options:

A. Secondary structure

B. Quaternary structure

C. Primary structure

D. Tertiary structure

Answer: C

Solution:

The constitution of a protein refers to its basic makeup—the specific sequence of amino acids that form the protein. This level of organization is known as the **primary structure** of the protein.

Here's a quick breakdown:

Primary Structure: The linear sequence of amino acids held together by peptide bonds.

Secondary Structure: Local arrangements such as alpha helices and beta sheets formed by hydrogen bonding.

Tertiary Structure: The overall three-dimensional folding of a single polypeptide.

Quaternary Structure: The arrangement of multiple polypeptide subunits in a multi-subunit protein.

Since "constitution" is about the fundamental composition, the correct answer is:

Option C: Primary structure.

Question29

Carrot and curd are sources for the vitamins repectively.

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Options:

A. A, B_{12}

B. A. B_1

C. E. Pyridoxine

D. E. Riboflavin

Answer: A

Solution:

Carrots are a source of vitamin A, which is a fat-soluble vitamin essential for maintaining good vision and supporting the immune system. On the other hand, curd provides vitamin B_{12}, a water-soluble vitamin that is important for blood cell formation.

Question30

Which of the following represents simplified version of nucleoside?

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Options:

A. Base - sugar - phosphate

B. Sugar - base

C. Sugar - Phosphate

D. Base - Phosphate

Answer: B

Solution:

A nucleoside consists solely of a sugar and a nitrogenous base. When a phosphate group is added, it becomes a nucleotide. Therefore, the simplified version of a nucleoside is represented by:

$$\text{Nucleoside} = \text{Sugar} + \text{Base}$$

So, the correct answer is Option B: Sugar - base.

Question31

The number of essential and non-essential amino acids from the following list respectively isVal, Gly, Leu, Lys, Pro, Ser

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Options:

A. 5,1

B. 4,2

C. 2,4

D. 3,3

Answer: D

Solution:

Essential amino acids are those amino acids, which the body cannot produce by themselves.

While non-essential amino acids are produced by body itself.

Essential	Non-essential
Amino acid	Amino acid
Valine (Val)	Glycine (Gly)
Leucine (Leu)	Proline (Pro)
Lysine (Lys)	Serine (Ser)

Question32

The carbohydrate which does not react with ammonical $AgNO_3$ solution is

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Options:

A. sucrose

B. maltose

C. lactose

D. fructose

Answer: A

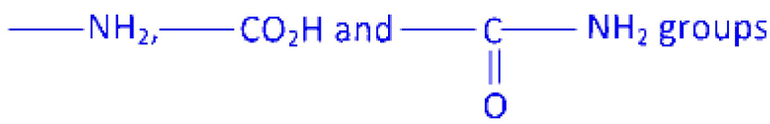
Solution:

Tollens' reagent, which is an ammoniacal silver nitrate solution $[Ag(NH_3)_2OH]$, is used to test for reducing sugars. Reducing sugars have a free aldehyde group that reacts with Tollens' reagent.

In the case of sucrose ($C_{12}H_{22}O_{11}$), there is no free anomeric carbon available to act as a reducing agent. Therefore, sucrose does not react with Tollens' reagent.

Question33

Identify the amino acid which has



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Options:

A. alanine

B. arginine

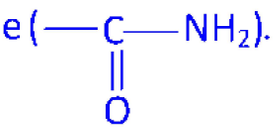
C. asparagine

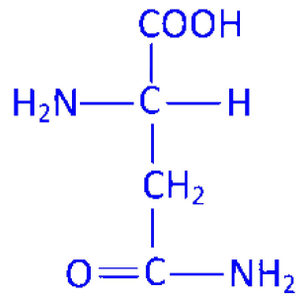
D. aspartic acid

Answer: C

Solution:

The asparagine amino acid consists of an alpha-amino group $(-NH_2)$, an alpha carboxylic group $(-COOH)$ and a side chain of

carboxamide ().



Question34

Which of the following is an essential amino acid ?

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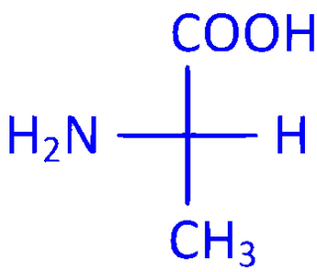
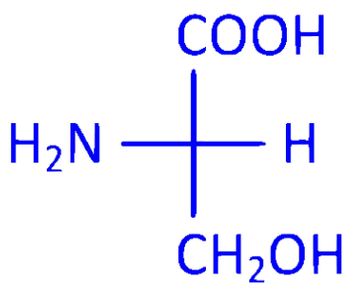
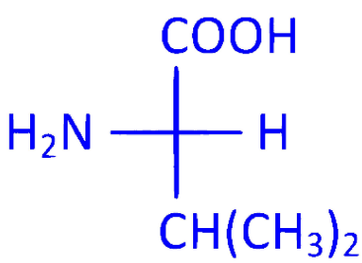
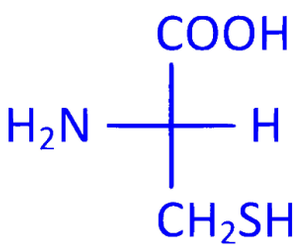
Options:

A. 

B. 

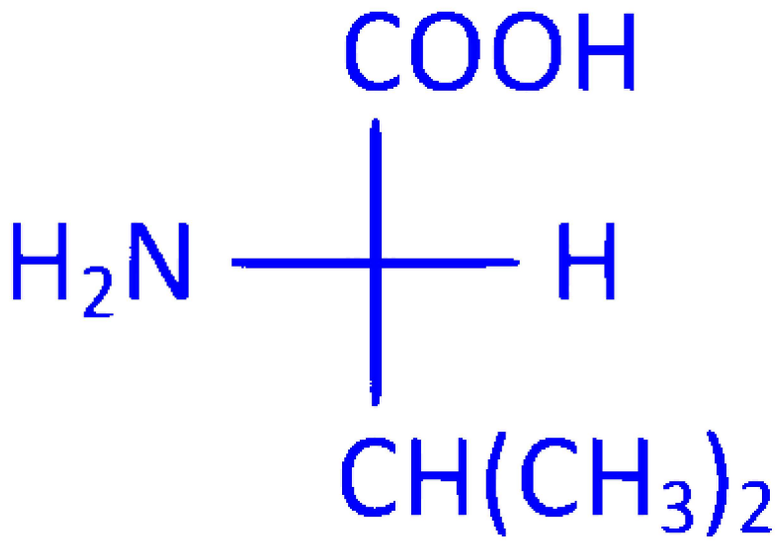
C. 

D. 

Answer: C

Solution:

Among the given structure valine is an essential amino acid.



Other essential amino acids are : Leucine, isoleucine, lysine etc. Essential amino acid are not synthesised in human body. Hence, it is obtained from other food sources.

Question35

Which of the following hormone is responsible for preparing uterus for implantation of fertilised eggs?

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Options:

A. Estradiol

B. Progesterone

C. Testosterone

D. Thyroxin

Answer: B

Solution:

The correct answer is Option B: Progesterone.

Here's why:

After ovulation, the corpus luteum releases progesterone.

Progesterone prepares the endometrium (the lining of the uterus) by thickening it, making it suitable for the implantation of a fertilized egg.

Although estradiol (Option A) plays a key role in the initial growth of the uterine lining, it is progesterone that ensures the lining is receptive.

Testosterone (Option C) and thyroxin (Option D) do not have a direct role in preparing the uterus for implantation.

Thus, progesterone is essential for a successful implantation process.

Question36

Match the following

	List - I (Enzyme)		List - II (Reaction)
A.	Invertase	I.	Maltose $\rightarrow$ Glucose
B.	Pepsin	II.	Sucrose $\rightarrow$ Glucose + Fructose
C.	Diastase	III.	Proteins $\rightarrow$ Peptides
		IV.	Starch $\rightarrow$ Maltose

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Options:

A. A-IV, B-I, C-III

B. A-I, B-III, C-II

C. A-II, B-III, C-IV

D. A-II, B-IV, C-III

Answer: C

Solution:

$$\text{Sucrose} \xrightarrow{\text{Invertase}} \text{Glucose} + \text{Fructose}$$

$$\text{Proteins} \xrightarrow{\text{Pepsin}} \text{Peptides}$$

$$\text{Starch} \xrightarrow{\text{Diastase}} \text{Maltose}$$

The correct match is A-II, B-III, C-IV.

Question37

Carbohydrates are stored in plants and animals in which of the following forms respectively?

AP EAPCET 2022 - 5th July Morning Shift

Options:

A. Glycogen, starch

B. Glycogen, glycogen

C. Starch, starch

D. Starch, glycogen

Answer: D

Solution:

Carbohydrates are stored in plants and animals in different forms because their storage needs and structures vary. In plants, carbohydrates are typically stored as starch, while in animals, they are stored as glycogen.

To understand this better, let's look at each storage form:

Starch: Starch is a polysaccharide that serves as a storage form of energy in plants. It is composed of two molecules, amylose and amylopectin, which are both polymers of glucose. Starch is stored in plastids (like chloroplasts and amyloplasts) within plant cells.

Glycogen: Glycogen is a highly branched polysaccharide formed of glucose units, similar to starch but more extensively branched. It is the primary storage form of carbohydrate in animals and is predominantly stored in the liver and muscle tissues.

Given these details, the correct forms of carbohydrate storage in plants and animals are:

Option D: **Starch in plants and Glycogen in animals**.

Question38

Glycylalanine is a dipeptide of which amino acids?

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Options:

A. H_2NCH_2COOH and $H_2NCH(CH_3)COOH$

B. $(CH_3)_2CHCH(NH_2)COOH$ and H_2NCH_2COOH

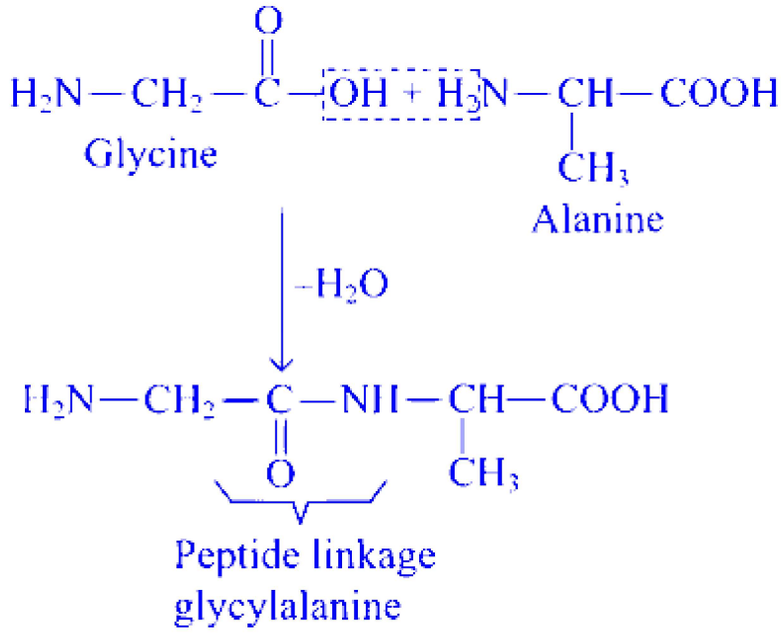
C. $(CH_3)_2CHCH_2CH(NH_2)COOH$ and H_2NCH_2COOH

D. $(CH_3)_2CHCH(NH_2)COOH$ and $(CH_3)_2CH(NH_2)COOH$

Answer: A

Solution:

Glycylalanine is a dipeptide made up of glycine and L-alanine residues. When glycine and alanine link together, a water molecule is released and glycylalanine is formed which works as a metabolite:



Question39

Pernicious anemia is caused due to deficiency of which vitamin ?

AP EAPCET 2022 - 4th July Evening Shift

Options:

A. B12

B. B1

C. B6

D. B2

Answer: A

Solution:

Our body needs vitamin B_{12} to make red blood cells. Deficiency of vitamin B_{12} causes a rare blood disorder also known as pernicious anemia. It is characterised by inability of body to produce red blood cells.

Question40

Which of the following vitamins cannot be stored in the body?

AP EAPCET 2022 - 4th July Evening Shift

Options:

A. A

B. C

C. E

D. K

Answer: B

Solution:

Vitamin C is a water soluble vitamin. So, it is excreted with the urine. Other vitamins like, A, E and K are fat soluble thus, can be stored in the body.

But vitamin C cannot be stored in the body.

Question41

Which hormone tends to increase the blood glucose level in human?

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Options:

A. Insulin

B. Glucagon

C. Epinephrine

D. Estrogen

Answer: B

Solution:

Glucagon is a peptide hormone produced by alpha cells of pancreas. It raises the concentration of blood glucose in human.

Question42

Which of the following molecules is eliminated during peptide bond formation?

AP EAPCET 2022 - 4th July Morning Shift

Options:

A. H_2O

B. NH_3

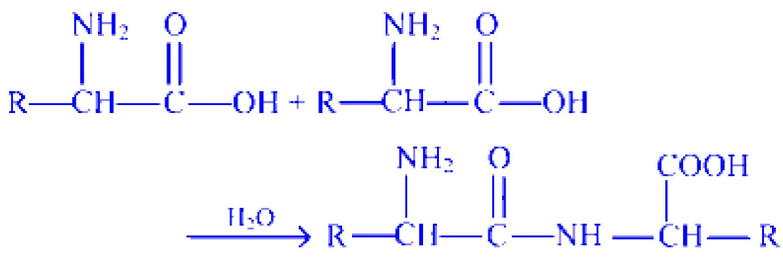
C. CH_3OH

D. CO_2

Answer: A

Solution:

A peptide bond is formed when carboxyl group of α-amino acid reacts with amine group of α-amino acids. This proceeds by dehydration i.e. removal of a water molecule.



Question43

The human body does not produce

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Options:

A. enzymes

B. DNA

C. vitamines

D. hormones

Answer: C

Solution:

Vitamins are substances that body need togrow and develop normally. As human body doesnot produce vitamins, it is required to take in diet.

Question44

Vitamin-B_1 is

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Options:

A. riboflavin

B. cobalamine

C. thiamine

D. pyridoxine

Answer: C

Solution:

Vitamin-B_1 is thiamine which is water solublevitamin.
Vitamin-B_2 is Riboflavin, B_{12} is cobalamine and B_6 is pyridoxine.

Question45

Assertion (A) An optically active aminoacid can exist in three forms depending onthe pH of the solution.

Reason (R) Amino acids contain both acidicand basic groups, they exist as Zwitter ion in aq. medium, anionic form in acidic mediumand cationic form in basic medium.

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Options:

A. A and R are correct and R is the correct explanation for A.

B. A and R are correct but R is not the correct explanation for A.

C. A is correct but R is incorrect.

D. A is incorrect but R is correct.

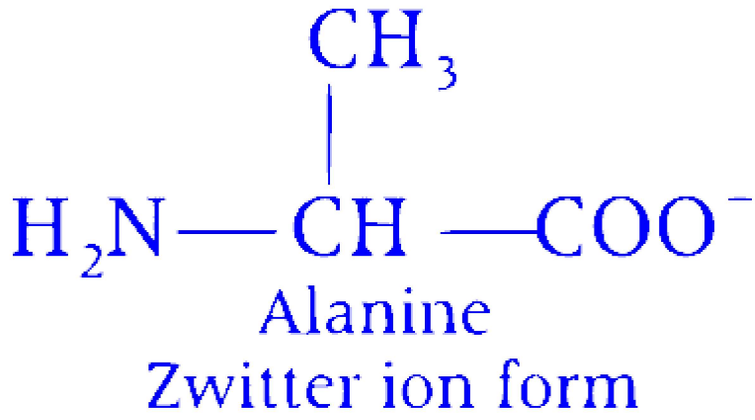
Answer: C

Solution:

As the molecule exist in 3 states in aqueoussolution, it means, it is a amino acid. Alanine isexample of amino acid.

In aqueous medium alanine is exist as a Zwitterion.

Cationic form of alanine exists in acidic medium.



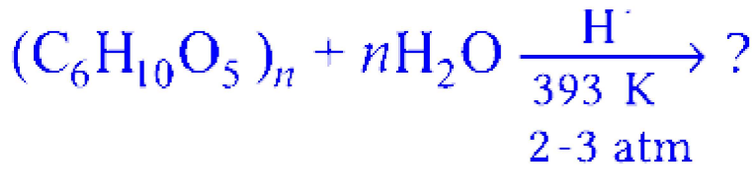
Alanine

Zwitter ion form

Hence, Assertion is correct but Reason is incorrect.

Question46

Identify the product of the followingreaction.



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Options:

A. Fructose

B. Glucose

C. Lactose

D. Maltose

Answer: B

Solution:

Preparation of glucose from starch Whenstarch is boiled with dilute sulphuric acid at 393 Kunder pressure 2-3 atm. It is hydrolysed to giveglucose

$$\underset{\text{Starch}}{(C_6H_{10}O_5)_n} + nH_2O \xrightarrow[343\text{ K},2-3\text{ atm}]{\text{Dil. } H_2SO_4} n\underset{\text{Glucose}}{C_6H_{12}O_6}$$

On completing the reaction, excess H_2SO_4 is neutralised by addition of chalk powder and solution is decolourised by activated charcoal.

Question47

During the action of enzyme ‘zymase’glucose is converted into ....., with theliberation of carbon dioxide gas.

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Options:

A. phenol

B. ethanol

C. methanol

D. isopropyl alcohol

Answer: B

Solution:

The process which converts glucose into ethylalcohol with the liberation of CO_2 is known asalcoholic fermentation. Such reactions are carriedout by yeasts as a part of their anerobic respirationprocess. The process occurs in the presence ofzymase enzyme, which is present in yeast. Thismethod is used in the preparation of alcohol.

$$\underset{\text{Glucose}}{C_6H_{12}O_6} + \text{Zymase} \rightarrow \underset{\text{Ethanol}}{2C_2H_5OH} + \underset{\text{Carbon dioxide}}{2CO_2}$$
