Biomolecules

Question1

Two nucleotides are joined together by a linkage known as : [27-Jan-2024 Shift 1]

Options:

A. Phosphodiester linkage

B. Glycosidic linkage

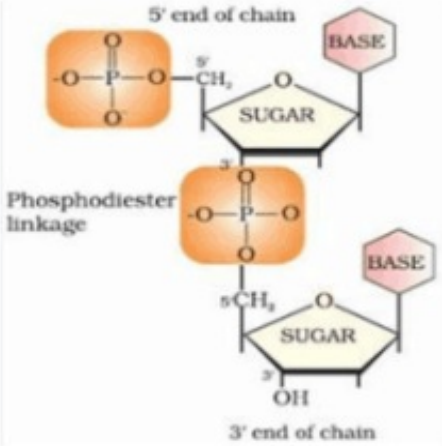
C. Disulphide linkage

D. Peptide linkage

Answer: A

Solution:

Phosphodiester linkage



Question2

Two nucleotides are joined together by a linkage known as : [27-Jan-2024 Shift 1]

Options:

A. Phosphodiester linkage

B. Glycosidic linkage

C. Disulphide linkage

D. Peptide linkage

Answer: A

Question3

Which structure of protein remains intact after coagulation of egg white on boiling?
[27-Jan-2024 Shift 2]

Options:

A. Primary

B. Tertiary

C. Secondary

D. Quaternary

Answer: A

Solution:

Solution:
Boiling an egg causes denaturation of its protein resulting in loss of its quarternary, tertiary and secondary structures.

Question4

Type of amino acids obtained by hydrolysis of proteins is :
[29-Jan-2024 Shift 1]

Options:

A. β

B. α

C. δ

D. γ

Answer: B

Solution:

Solution:
Proteins are natural polymers composed of α-amino acids which are connected by peptide linkages.
Hence proteins upon acidic hydrolysis produce α-amino acids.

Question5

Match List I with List II

LIST-I (Substances)	LIST-II (Element Present)
A.Ziegler catalyst	I.Rhodium
B.Blood Pigment	II. Cobalt
C.Wilkinson catalyst	III.Iron
D.Vitamin B_{12}	IV.Titanium

Choose the correct answer from the options given below:
[29-Jan-2024 Shift 1]

Options:

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

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

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

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

Answer: D

Solution:

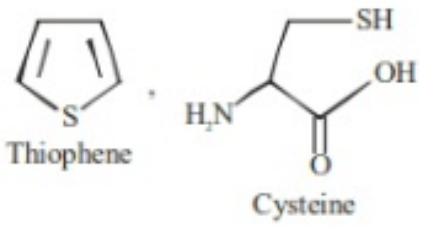
Ziegler catalyst ⟶ Titanium
Blood pigment ⟶ Iron
Wilkinson catalyst ⟶ Rhodium
Vitamin B_{12} ⟶ Cobalt

Question6

Number of compounds among the following which contain sulphur as heteroatom is
Furan,Thiophene, Pyridine, Pyrrole, Cysteine, Tyrosine
[29-Jan-2024 Shift 1]

Answer: 2

Solution:



Question7

Match List I with List II

	List I (Bio Polymer)		List II (Monomer)
A.	Starch	I.	nucleotide
B.	Cellulose	II.	α-glucose
C.	Nucleic acid	III.	β-glucose
D.	Protein	IV.	α-amino acid

Choose the correct answer from the options given below :- [29-Jan-2024 Shift 2]

Options:

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

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

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

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

Answer: D

Solution:

Solution:
A-II, B-III, C-I, D-IV
Fact based.

Question8

Sugar which does not give reddish brown precipitate with Fehling's reagent is: [30-Jan-2024 Shift 1]

Options:

A. Sucrose

B. Lactose

C. Glucose

D. Maltose

Answer: A

Solution:

Sucrose do not contain hemiacetal group.
Hence it does not give test with Fehling solution.
While all other give positive test with Fehling solution

Question9

The total number of correct statements, regarding the nucleic acids is
A. RNA is regarded as the reserve of genetic information.
B. DNA molecule self-duplicates during cell division
C. DNA synthesizes proteins in the cell.
D. The message for the synthesis of particular proteins is present in DNA
E. Identical DNA strands are transferred to daughter cells.
[30-Jan-2024 Shift 2]

Answer: 3

Solution:

Solution:
A. RNA is regarded as the reserve of genetic information. (False)
B. DNA molecule self-duplicates during cell division. (True)
C. DNA synthesizes proteins in the cell. (False)
D. The message for the synthesis of particular proteins is present in DNA. (True)
E. Identical DNA strands are transferred to daughter cells. (True)

Question10

Match List I with List II

	LIST-I		LIST-II
A.	Glucose/NaHCO/Δ	I.	Gluconic acid
B.	Glucose/ HNO_3	II.	No reaction
C.	Glucose/HI/ Δ	III.	n-hexane
D.	Glucose/Bromine water	IV.	Saccharic acid

Choose the correct answer from the options given below:
[31-Jan-2024 Shift 1]

Options:

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

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

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

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

Answer: B

Solution:

Solution:

$$\text{Glucose} \xrightarrow[\Delta]{NaHCO_3} \text{no reaction}$$

$$\text{Glucose} \xrightarrow[\Delta]{HNO_3} \text{saccharic acid}$$

$$\text{Glucose} \xrightarrow[\Delta]{HI} \text{n-hexane}$$

$$\text{Glucose} \xrightarrow[\Delta]{Br_2} \text{Gluconic acid}$$

Question11

From the vitamins A, B_1, B_6, B_{12}, C, D, E and K, the number vitamins that can be stored in our body is___
[31-Jan-2024 Shift 2]

Answer: 5

Solution:

Solution:
Vitamins A, D, E, K and B_{12} are stored in liver and adipose tissue.

Question12

A compound (x) with molar mass $108 g mol^{-1}$ undergoes acetylation to give product with molar mass $192 g mol^{-1}$. The number of amino groups in the compound (x) is_____
[31-Jan-2024 Shift 2]

Answer: 2

Solution:

$R-NH_2 + CH_3-\overset{\overset{O}{\|}}{C}-Cl \rightarrow R-NH-\overset{\overset{O}{\|}}{C}-CH_3$

Gain in molecular weight after acylation with one $-NH_2$ group is 42 .

Total increase in molecular weight = 84

$\therefore$ Number of amino group in x = $\frac{84}{42} = 2$

Question13

If one strand of a DNA has the sequence ATGCTTCA, sequence of the bases in complementary strand is:
[1-Feb-2024 Shift 1]

Options:

A. CATTAGCT

B. TACGAAGT

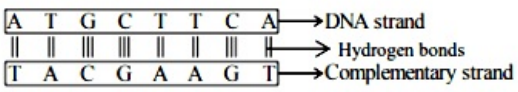
C. GTACTTAC

D. ATGCGACT

Answer: B

Solution:

Solution:
Adenine base pairs with thymine with 2 hydrogen bonds and cytosine base pairs with guanine with 3 hydrogen bonds.



Question14

The number of tripeptides formed by three different amino acids using each amino acid once is_____
[1-Feb-2024 Shift 2]

Answer: 6

Solution:

Solution:
Let 3 different amino acid are A, B, C then following combination of tripeptides can be formed-
ABC, ACB, BAC, BCA, CAB, CBA

Question15

A short peptide on complete hydrolysis produces 3 moles of glycine (G), two moles of leucine (L) and two moles of valine (V) per mole of peptide. The number of peptide linkages in it are _____.
[30-Jan-2023 Shift 2]

Answer: 6

Solution:

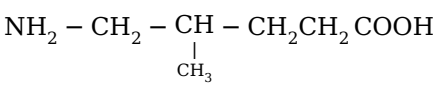
Solution:
Number of peptide linkage = (amino acid -1)
$= 7 - 1 = 6$

Question16

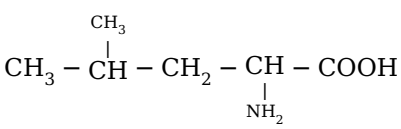
A protein ' X ' with molecular weight of 70, 000u, on hydrolysis gives amino acids. One of these amino acid is
[31-Jan-2023 Shift 1]

Options:

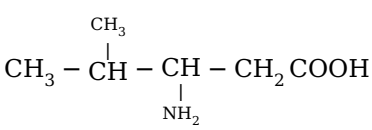
A.



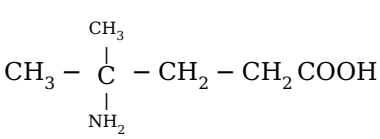
B.



C.



D.



Answer: B

Solution:

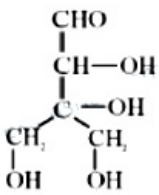
Only in option (2) α-Amino acid is given all the other options are not α-Amino acids.

Question17

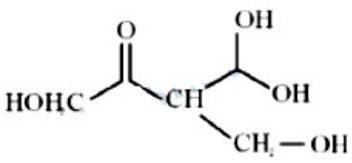
Compound A, $C_5H_{10}O_5$, given a tetraacetate with Ac_2O and oxidation of A with $Br_2 - H_2O$ gives an acid, $C_5H_{10}O_6$. Reduction of A with HI gives isopentane. The possible structure of A is : [31-Jan-2023 Shift 2]

Options:

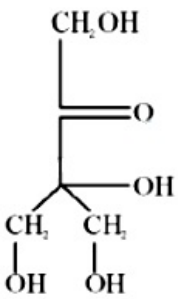
A.



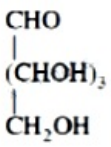
B.



C.



D.



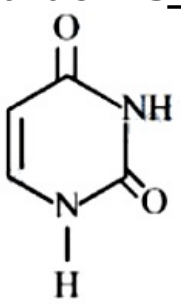
Answer: A

Solution:

(i) Formation of tetraacetete with Ac_2O means compound A has four $-OH$ linkage.
Reduction of A with HI gives Isopentane i.e. molecule contains five carbon atom.

Question18

Uracil is base present in RNA with the following structure. % of N in uracil is___



Given :
Molar mass N = 14gmol^{-1}; O = 16gmol^{-1}; C = 12gmol^{-1}; H = 1gmol^{-1};
[24-Jan-2023 Shift 1]

Answer: 25

Solution:

Mol. Wt of $C_4N_2H_4O_2$ = 112

$$\%N = \frac{28}{112} \times 100 = 25\%$$

Question19

Total number of tripeptides possible by mixing of valine and proline is___
[24-Jan-2023 Shift 2]

Answer: 8

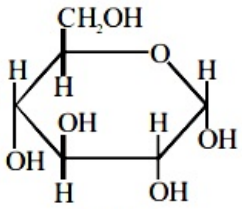
Solution:

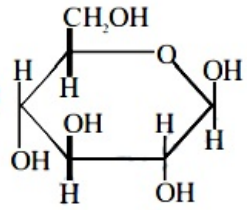
No. of possible tripeptide :
Val & Pro is 2^3
(1) val - val - val
(2)pro - pro - pro
(3) val - pro - pro
(4)pro - val - pro
(5) val - val - pro
(6)val - pro - val
(7)pro - pro - val
(8)pro - val - val

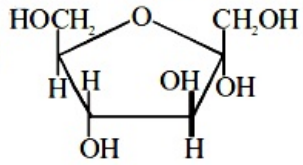
Question20

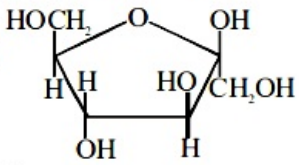
Match items of Row I with those of Row II.

Row I :

(P) 

(Q) 

(R) 

(S) 

Row II :

(i) α-D-(-) Fructofuranose.

(ii) β-D-(-) Fructofuranose

(iii) α-D-(-) Glucopyranose.

(iv) β-D-(-) Glucopyranose

Correct match is

[25-Jan-2023 Shift 1]

Options:

A. P → iv, Q → iii, R → i, S → ii

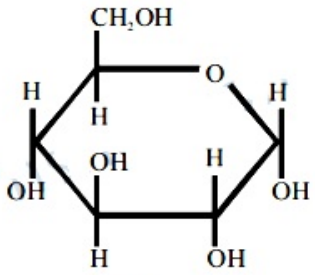
B. P → i, Q → ii, R → iii, S → iv

C. P → iii, Q → iv , R → ii, S → i

D. P → iii, Q → iv, R → i, S → ii

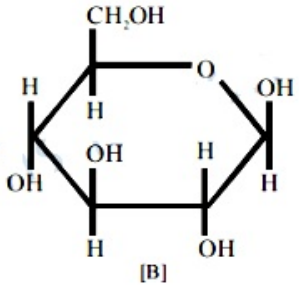
Answer: D

Solution:

Structure 

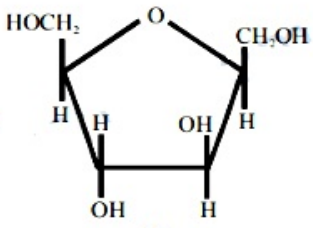
[A]

Represents alpha-D-(+) Glucopyranose

Structure 

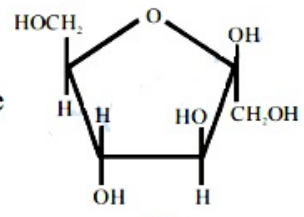
[B]

Represents beta-D- (+) Glucopyranose

Structure 

[C]

Represents beta-D-(-) Fructofuranose

Structure 

[D]

Represents beta-D- (−) Fructofuranose

(from the given options best answer is D)

Question21

Number of cyclic tripeptides formed with 2 amino acids A and B is: [29-Jan-2023 Shift 1]

Options:

A. 2

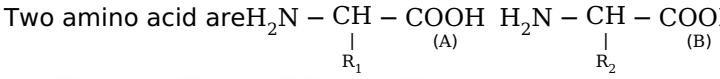
B. 3

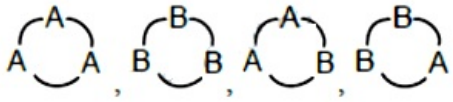
C. 5

D. 4

Answer: D

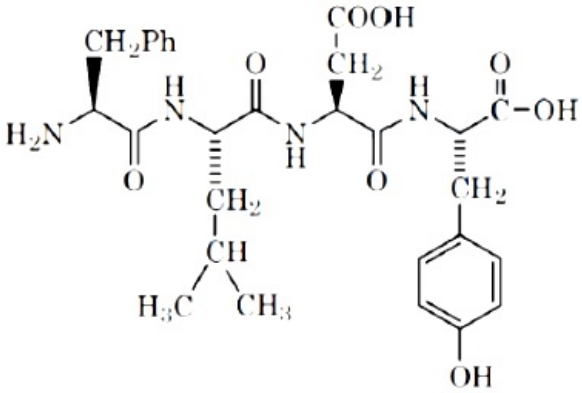
Solution:

Two amino acid are  Tripeptide are formed from three amino acids



Question22

Following tetrapeptide can be represented as



(F, L, D, Y, I, Q, P are one letter codes for amino acids) [29-Jan-2023 Shift 2]

Options:

A. FIQY

B. FLDY

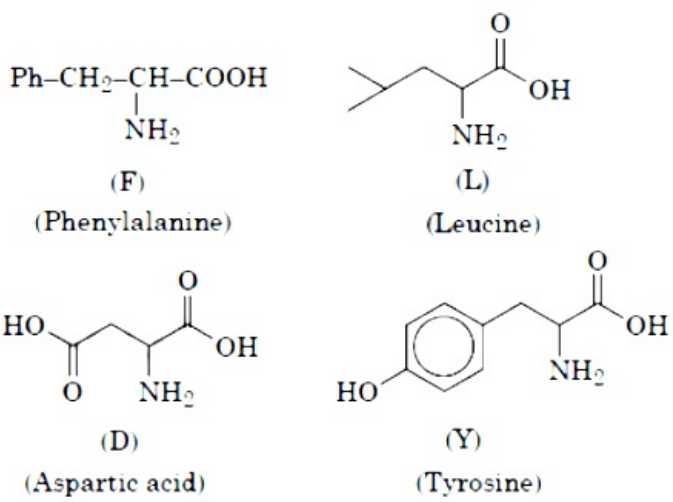
C. YQLF

D. PLDY

Answer: B

Solution:

Solution:
Hydrolysis of the given tetrapeptide will give the following:



Question23

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : Ketoses give Seliwanoff's test faster than Aldoses.
Reason (R) : Ketoses undergo β-elimination followed by formation of furfural.
In the light of the above statements, choose the correct answer from the options given below :
[30-Jan-2023 Shift 1]

Options:

A. (A) is false but (R) is true

B. Both (A) and (R) are true and (R) is the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are true but (R) is not the correct explanation of (A)

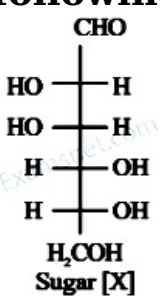
Answer: C

Solution:

Solution:
Seliwanoff's test is a differentiating test for Ketose and aldose. This test relies on the principle that the keto hexose are more rapidly dehydrated to form 5 -hydroxy methyl furfural when heated in acidic medium which on condensation with resorcinol, Cherry red or brown red coloured complex is formed rapidly indicating a positive test.

Question24

The correct representation in six membered pyranose form for the following sugar [X] is

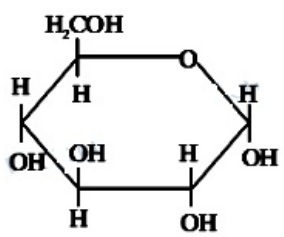


Sugar [X]

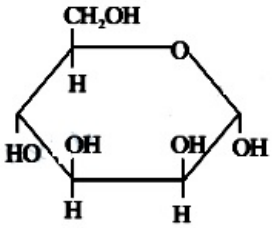
[1-Feb-2023 Shift 1]

Options:

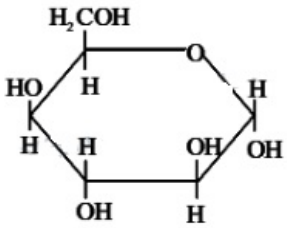
A.



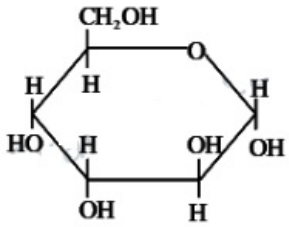
B.



C.



D.



Answer: B

Solution:

Solution:
By Haworth structure of mannose.

Question25

Match List I and List II

List I Test	List II Functional group /Class of Compound
A. Molisch's Test	I. Peptide
B. Biuret Test	II. Carbohydrate
C. Carbylamine Test	III. Primary amine
D. Schiff s Test	IV. Aldehyde

Choose the correct answer from the options given below: [1-Feb-2023 Shift 1]

Options:

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

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

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

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

Answer: C

Solution:

Solution:

List I Test	List II Functional group /Class of Compound
A. Molisch's Test	II. Carbohydrate
B. Biuret Test	I. Peptide
C. Carbylamine Test	III. Primary amine
D. Schiff s Test	IV. Aldehyde

Question26

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : α-halocarboxylic acid on reaction with dil. NH_3 gives good yield of α-amino carboxylic acid whereas the yield of amines is very low when prepared from alkyl halides.
Reason (R) : Amino acids exist in zwitter ion form in aqueous medium.|

In the light of the above statements, choose the correct answer from the options given below :
[1-Feb-2023 Shift 2]

Options:

A. Both (A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is not correct.

D. (A) is not correct but (R) is correct.

Answer: B

Question27

Match List I with List II

List I Vitamin	List II Deficiency disease
A) Vitamin A	I. Beri-Beri
B) Thiamine	II. Cheilosis
C) Ascorbic acid	III. Xeropthalmia
D) Riboflavin	IV. Scurvy

Choose the correct answer from the options given below: [6-Apr-2023 shift 1]

Options:

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

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

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

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

Answer: D

Solution:

Question28

Match List I with List II

List I	List II
Natural Amino acid	One Letter Code
(A) Arginine	(I) D
(B) Aspartic acid	(II) **N**
(C) Asparagine	(III) A
(D) Alanine	(IV) **R**

Choose the correct answer from the options given below :- [6-Apr-2023 shift 2]

Options:

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

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

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

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

Answer: D

Solution:

Question29

Sulphur (S) containing amino acids from the following are:
(a) isoleucine
(b) cysteine
(c) lysine
(d) methionine
(e) glutamic acid
[8-Apr-2023 shift 1]

Options:

A. b, c, e

B. a, d

C. a, b, c

D. b, d

Answer: D

Solution:

(a) isoleucine : $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{C}H - \underset{\underset{NH_2}{|}}{C}H - COOH$

(b) cysteine : $HS - CH_2 - \underset{\underset{NH_2}{|}}{C}H - COOH$

(c) lysine : $H_2N - (CH_2)_4 - \underset{\underset{NH_2}{|}}{C}H - COOH$

(d) methionine : $CH_3 - S - CH_2 - CH_2 - \underset{\underset{NH_2}{|}}{C}H - COOH$

(e) glutamic acid : $HOOC - CH_2 - CH_2 - \underset{\underset{NH_2}{|}}{C}H - COOH$

Question30

Match list I with list II

LIST - I Natural amino acid	LIST - II One letter code
A. Glutamic acid	I. Q
B. Glutamine	II. W
C. Tyrosine	III. E
D. Tryptophan	IV. Y

Choose the correct answer from the options given below:
[8-Apr-2023 shift 2]

Options:

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

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

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

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

Answer: A

Solution:

Solution:
A-III, B-I, C-IV, D-II
Fact

Question31

The one that does not stabilize 2° and 3° structures of proteins is
[10-Apr-2023 shift 1]

Options:

A. H-bonding

B. -S-S-linkage

C. van der waals forces

D. $-O-O-$-linkage

Answer: D

Solution:

Fact
The main forces which stabilize the secondary and tertiary structure of proteins are
→ Hydrogen bonds
→S – S Linkages
→ vanderwaals force

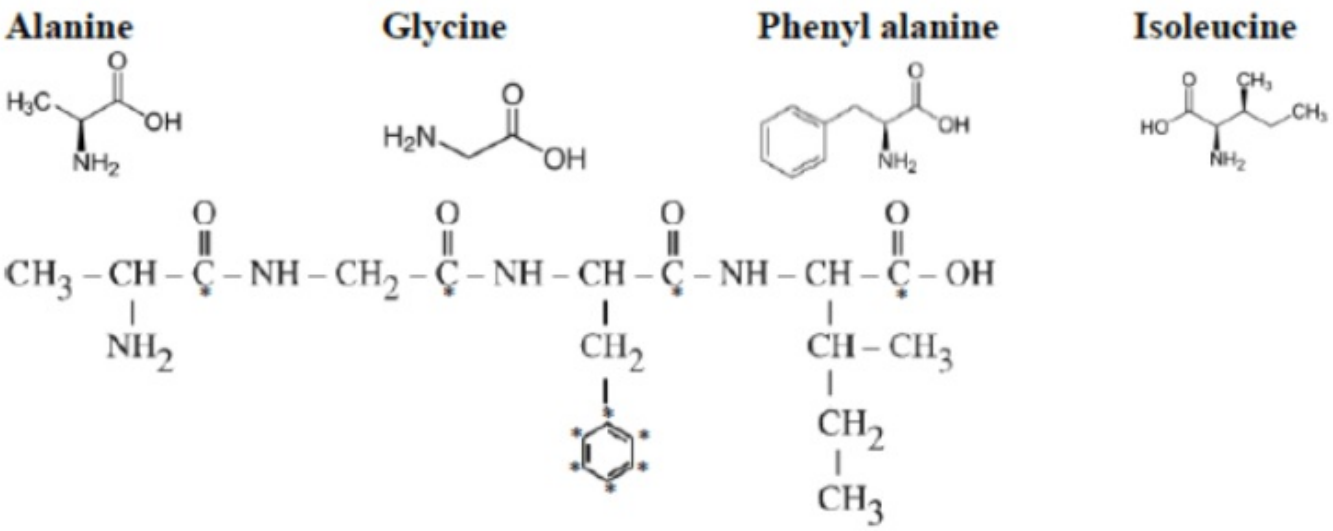
→ electrostatic force of attraction

Question32

In an oligopeptide named Alanylglycylphenyl alanyl isoleucine, the number of sp^2 hybridised carbons is
[12-Apr-2023 shift 1]

Answer: 10

Solution:



Question33

The naturally occurring amino acid that contains only one basic functional group in its chemical structure is :
[13-Apr-2023 shift 2]

Options:

A. histidine

B. lysine

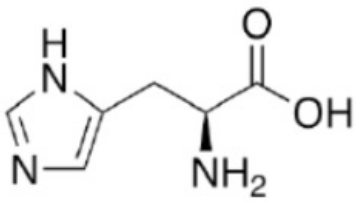
C. asparagine

D. arginine

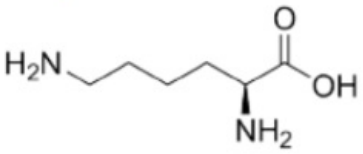
Answer: C

Solution:

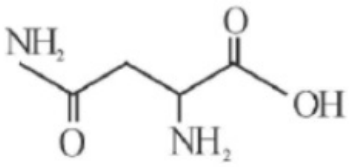
1. histidine



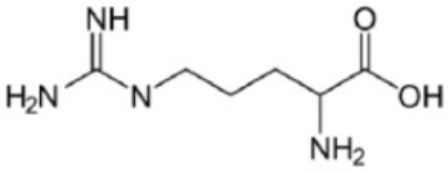
2. Lysine



3.



4. Arginine



Question34

Which is not true for arginine? [15-Apr-2023 shift 1]

Options:

A. It has high solubility in benzene

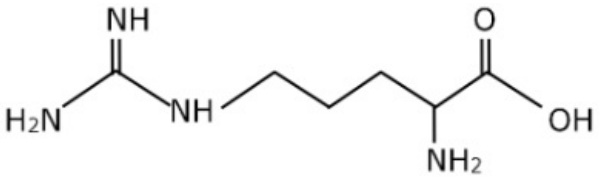
B. It is associated with more than one pK_a values.

C. It is a crystalline solid.

D. It has a fairly high melting point.

Answer: A

Solution:



Arginine exist is zwitterion, so solid nature and soluble in polar solvent.
(i) Polar, so not high soluble in benzene
(ii) It has 3 pKa values
(iii) True
(iv) High molecular mass to high M.P.

Question35

Sugar moiety in DNA and RNA molecules respectively are [29-Jun-2022-Shift-1]

Options:

A. β-D-2-deoxyribose, β-D-deoxyribose.

B. β-D-2-deoxyribose, β-D-ribose

C. β-D-ribose, β-D-2-deoxyribose.

D. β-D-deoxyribose, β-D-2-deoxyribose.

Answer: B

Solution:

Solution:
DNA contains ⇒β − D − 2− deoxyribose
RNA contains ⇒β − D - ribose

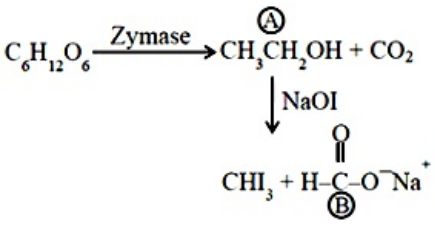
Question36

$$C_6H_{12}O_6 \xrightarrow{\text{Zymase}} A \xrightarrow[\Delta]{NaOI} B + CHI_3$$

The number of carbon atoms present in the product B is____ [29-Jun-2022-Shift-1]

Answer: 1

Solution:



no. of carbon atoms present in B is 1

Question37

The structure of protein that is unaffected by heating is [29-Jun-2022-Shift-2]

Options:

A. secondary structure

B. tertiary structure

C. primary structure

D. quaternary structure

Answer: C

Solution:

Solution:
The primary structure of protein is unaffected by physical 'or' chemical changes.

Question38

Which one of the following is a water soluble vitamin, that is not excreted easily? [26-Jun-2022-Shift-2]

Options:

A. Vitamin B_2

B. Vitamin B_1

C. Vitamin B_6

D. Vitamin B_{12}

Answer: B

Solution:

Solution:
B−complex (vitamins B group) is a water-soluble vitamin. Also, vitamin C is a water-soluble vitamin.

Vitamin A, D, E and K are fat soluble vitamins.

Question39

Given below are two statements.
Statement I : Maltose has two α-D-glucose units linked at C_1 and C_4 and is a reducing sugar.
Statement II : Maltose has two monosaccharides : α-D-glucose and β-D-glucose linked at C_1 and C_6 and it is a non-reducing sugar.
In the light of the above statements, choose the correct answer from the options given below :
[27-Jun-2022-Shift-2]

Options:

A. Both Statement I and Statement II are true.

B. Both Statement I and Statement II are false.

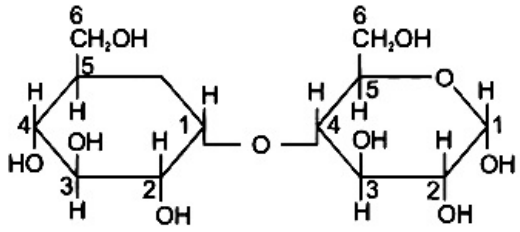
C. Statement I is true but Statement II is false.

D. Statement I is false but Statement II is true.

Answer: A

Solution:

Solution:
Maltose is composed of two α-D-glucose units in which C_1 of one glucose unit and C_4 of second glucose unit are linked.



Question40

Stability of α-Helix structure of proteins depends upon
[28-Jun-2022-Shift-1]

Options:

A. dipolar interaction

B. H-bonding interaction

C. van der Waals forces

D. π-stacking interaction

Answer: C

Solution:

Solution:
Mostly H-bonding is responsible for the stability of α-helix form.

Question41

When sugar ' X ' is boiled with dilute H_2SO_4 in alcoholic solution, two isomers ' A ' and ' B ' are formed. ' A ' on oxidation with HNO_3 yields saccharic acid where as ' B ' is laevorotatory. The compound ' X ' is : [28-Jun-2022-Shift-2]

Options:

A. Maltose

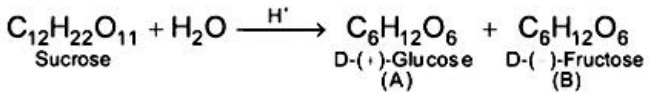
B. Sucrose

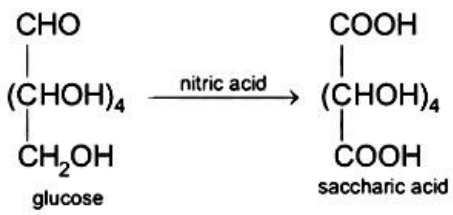
C. Lactose

D. Starch

Answer: A

Solution:





Question42

2.5g of protein containing only glycine ($C_2H_5NO_2$) is dissolved in water to make 500 mL of solution. The osmotic pressure of this solution at 300K is found to be 5.03×10^{-3} bar. The total number of glycine units present in the protein is_____
(Given : R = 0.083L bar $K^{-1}mol^{-1}$)
[28-Jun-2022-Shift-2]

Answer: 330

Solution:

Since,
$\pi = icRT$
$5.03 \times 10^{-3} = \frac{2.5}{M} \times \frac{1000}{500} \times 0.083 \times 300$
Molar mass of protein $= 24751.5 g / mol$
Number of glycine units in protein $= \frac{24751.5}{75}$
$= 330$

Question43

A polysaccharide ' X ' on boiling with dil H_2SO_4 at 393K under 2-3 atm pressure yields ' Y '. ' Y ' on treatment with bromine water gives gluconic acid. 'X' contains β-glycosidic linkages only. Compound ' X ' is : [24-Jun-2022-Shift-1]

Options:

A. starch

B. cellulose

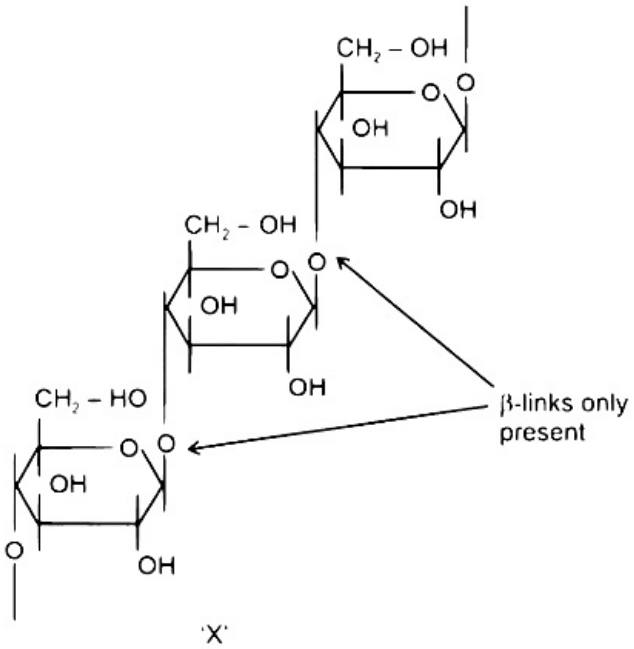
C. amylose

D. amylopectin

Answer: A

Solution:

Solution:
Cellulose contains β-glycosidic linkages only. Structure of cellulose



'X'

On boiling with dil. H_2SO_4 at 393K under 2-3 atm, ' X ' forms glucose, which given gluconic acid on treatment with

bromine water.

Question44

In *alanylglycylleucylalanylvaline*, the number of peptide linkages is ___
[24-Jun-2022-Shift-2]

Answer: 4

Solution:

The given pentapeptide is
ALA - GLY - LEU - ALA - VAL
It has 4 peptide linkages.

Question45

How many of the given compounds will give a positive Biuret test ?
Glycine, Glycylalanine, Tripeptide, Biuret
[25-Jun-2022-Shift-2]

Answer: 2

Solution:

Solution:
Biuret test is given by all proteins and peptides having atleast two peptide linkages.
Hence positive test must be given by tripeptide and Biuret.

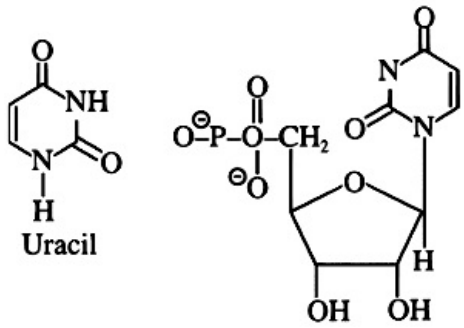
Question46

The number of oxygens present in a nucleotide formed from a base, that is present only in RNA is___
[26-Jun-2022-Shift-1]

Answer: 9

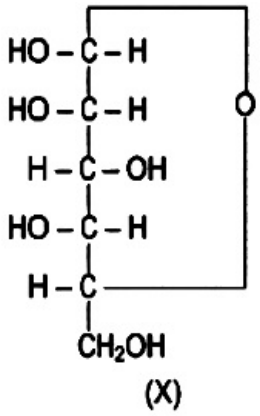
Solution:

Uracil is the base which only present is RNA.



Question47

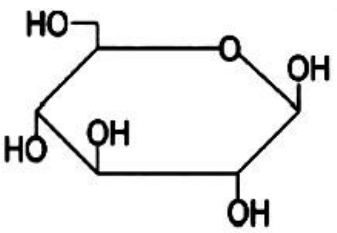
For the below given cyclic hemiacetal (X), the correct pyranose structure is :



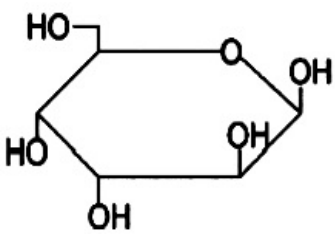
[28-Jul-2022-Shift-1]

Options:

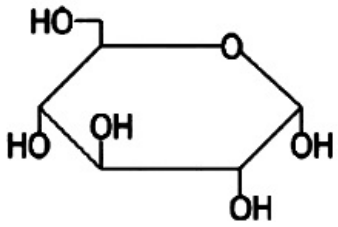
A.



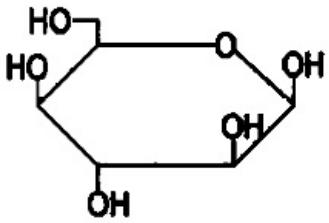
B.



C.

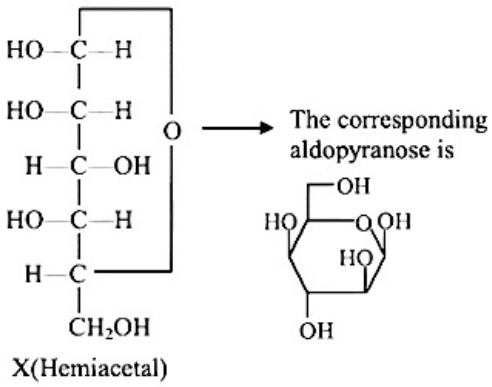


D.



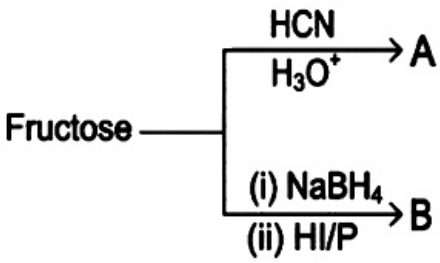
Answer: D

Solution:



Question48

The formulas of A and B for the following reaction sequence are



[28-Jul-2022-Shift-2]

Options:

A. A = $C_7H_{14}O_8$, B = C_6H_{14}A = C7H1408, B = C6H14

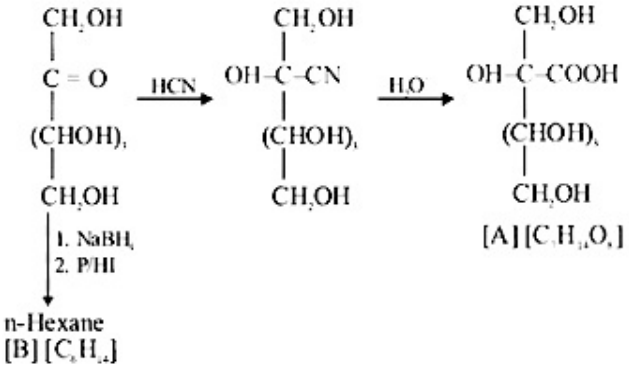
B. A = $C_7H_{13}O_7$, B = C_7H_{14}OA = C7H1307, B = C7H140

C. A = $C_7H_{12}O_8$, B = C_6H_{14}A = C7H12O8, B = C6H14

D. A = $C_7H_{14}O_8$, B = $C_6H_{14}O_6$A = C7H1408, B = C6H1406

Answer: A

Solution:



Question49

Glycosidic linkage between C1 of α-glucose and C2 of β-fructose is found in
[25-Jul-2022-Shift-2]

Options:

A. maltose

B. sucrose

C. lactose

D. amylose

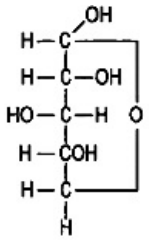
Answer: B

Question50

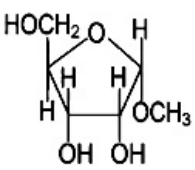
Which one of the following is a reducing sugar?
[26-Jul-2022-Shift-1]

Options:

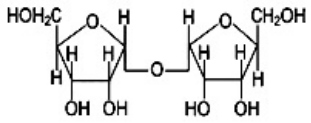
A.



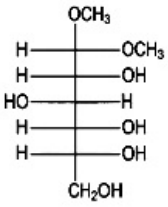
B.



C.



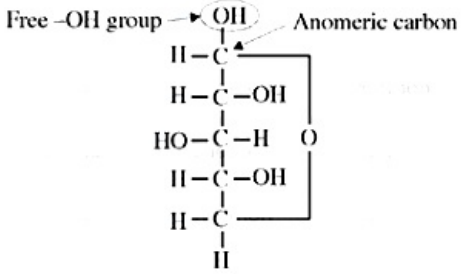
D.



Answer: A

Solution:

Solution:
If any sugar is having free −OH group at anomeric carbon then it will be a reducing sugar



Question51

Animal starch is the other name of [26-Jul-2022-Shift-2]

Options:

A. amylose.

B. maltose.

C. glycogen.

D. amylopectin.

Answer: C

Solution:

Solution:
Animal starch is the other name of glycogen because its structure is similar to amylopectin.

Question52

A sugar ' X ' dehydrates very slowly under acidic condition to give furfural which on further reaction with resorcinol gives the coloured product after sometime. Sugar ' X ' is
[27-Jul-2022-Shift-1]

Options:

A. Aldopentose

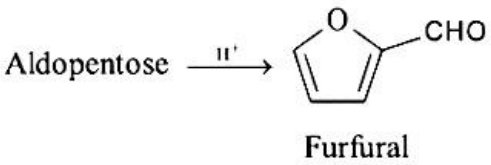
B. Aldotetrose

C. Oxalic acid

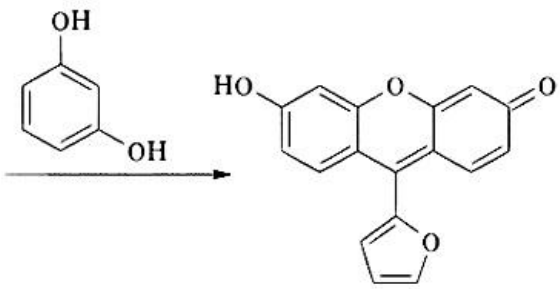
D. Ketotetrose

Answer: A

Solution:



Furfural



Cherry red product
(seliwanoff's test)

Question53

Match List - I with Match List - II.

List I	List II
(A)Glucose + HI	(I)Gluconic acid
(B)Glucose + Br_2 water	(II)Glucose pentacetate
(C)Glucose + acetic anhydride	(III)Saccharic acid
(D)Glucose $+HNO_3$	(IV)Hexane

Choose the correct answer from the options given below:
[27-Jul-2022-Shift-2]

Options:

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

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

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

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

Answer: A

Solution:

(A) $\text{Glucose} \xrightarrow{HI} \text{n-hexane}$

(B) $\text{Glucose} \xrightarrow[H_2O]{Br_2}$ $\begin{matrix}COOH\\|\\(CHOH)_4\\|\\CH_2OH\end{matrix}$ Gluconic acid

(C) $\text{Glucose} \xrightarrow[\text{anhydride}]{\text{5 acetic}} \text{Glucose pentacetate}$

(D) $\text{Glucose} \xrightarrow{HNO_3}$ $\begin{matrix}COOH\\|\\(CHOH)_4\\|\\COOH\end{matrix}$ Saccharic acid

---

Question54

In a linear tetrapeptide (Constituted with different amino acids), (number of amino acids) - (number of peptide bonds) is _____.
[29-Jul-2022-Shift-1]

Answer: 1

Solution:

In tetrapeptide
No. of amino acids = 4
No. of peptide bonds = 3
Hence, (1)

Question55

Given below are two statements. One is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Amylose is insoluble in water.
Reason R: Amylose is a long linear molecule with more than 200 glucose units.
In the light of the above statements, choose the correct answer from the options given below.
[29-Jul-2022-Shift-2]

Options:

A. A Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is NOT the correct explanation of A.

C. A is correct but R is not correct

D. A is not correct but R is correct.

Answer: B

Solution:

Solution:
Amylose is a linear polymer formed by combination of α − D glucose through 1 , 4- glycosidic linkage.
It is water soluble.
So, assertion is incorrect.

Question56

Match List-I with List-II.

List-I	List-II
A. Sucrose	(i) β-D-galactose and $\beta-D-$ glucose
B. Lactose	(ii) α-D-glucose and β-D-fructose
C. Maltose	(iii)α-D-glucose and α-D-glucose

Choose the correct answer from the options given below.
[26 Feb 2021 Shift 2]

Options:

A. A→ (i), B→ (iii), C→ (ii)

B. A→ (ii), B→ (i), C→ (iii)

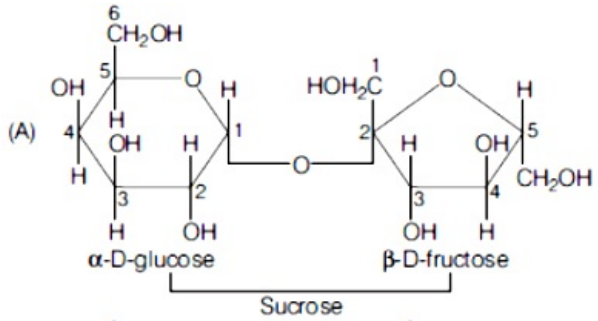
C. A→ (ii), B→ (i), C→ (iii)

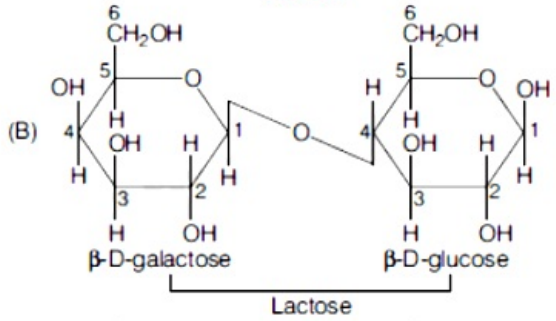
D. A→ (iii), B→ (ii), C→ (i)

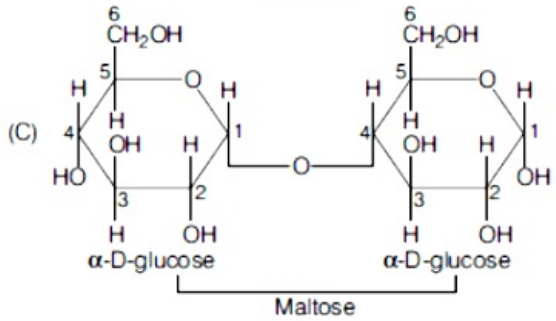
Answer: C

Solution:

Sucrose (cane sugar), lactose (milk sugar) and maltose are disaccharides in which two monosaccharides are hold together by a glycosidic linkage.
(A) In sucrose, C_1 of $\alpha-D-$ glucose and C_2 of $\beta-D-$ fructose are linked together (ii).
(B) In lactose, C_1 of β - D-galactose and C_4 of β-D-glucose are linked together (i).
(C) In maltose, C_1 of $\alpha-$ D-glucose is linked to C_4 of another $\alpha-D-$ glucose unit (iii).







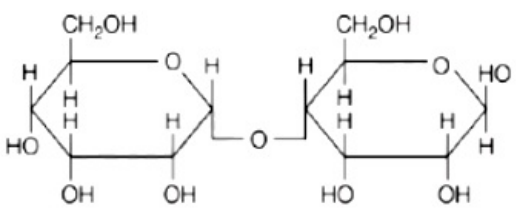
So, option (c) is the correct answer.

Question57

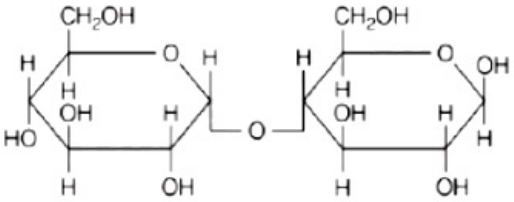
Which of the following is correct structure of α-anomer of maltose? [25 Feb 2021 Shift 2]

Options:

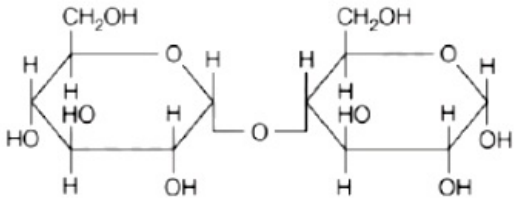
A.



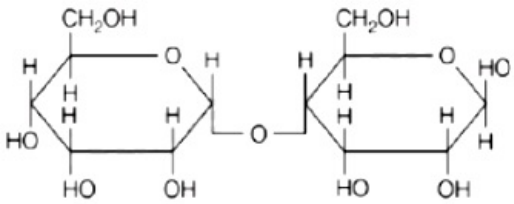
B.



C.



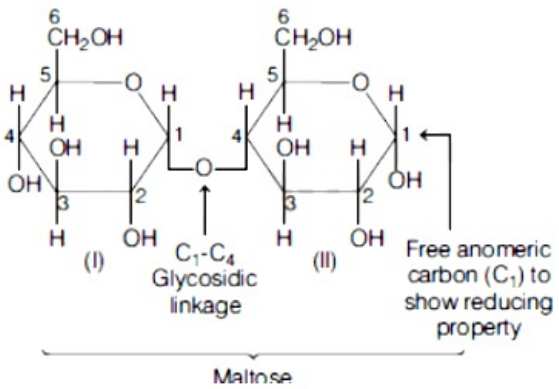
D.



Answer: C

Solution:

Solution:
Maltose is a disaccharide which is made of two α-D-glucose units in which C_1 (anomeric carbon) of one glucose (I) is linked to C_4 of another glucose unit (II).



Question58

Which of the glycosidic linkage between galactose and glucose is present in lactose?
[25 Feb 2021 Shift 1]

Options:

A. C-1 of galactose and C-4 of glucose

B. C-1 of galactose and C-6 of glucose

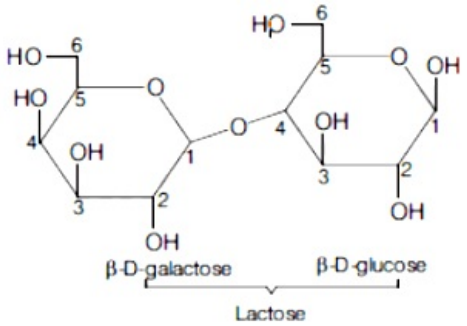
C. C − 1 of glucose and C − 4 of galactose

D. C-1 of glucose and C-6 of galactose

Answer: A

Solution:

Solution:
Glycosidic linkage is a type of covalent bond that joins carbohydrate molecules to another group.



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

Question59

Which of the following vitamin is helpful in delaying the blood clotting ? [26 Feb 2021 Shift 1]

Options:

A. Vitamin C

B. Vitamin B

C. Vitamin E

D. Vitamin K

Answer: D

Solution:

Solution:
Deficiency of vitamin K increases blood clotting time. So, vitamin K is helpful in blood clotting. It is a fat-soluble vitamin.
Vitamin C is used to prevent and treat scurvy. It is a water soluble vitamin.
Vitamin B are also water soluble and play significant roles in cell metabolism and synthesis of RBC.
Vitamin E is a fat-soluble vitamin. Deficiency of it may cause increased fragility of RBCs, nerve problems and mascular weakness.
Vitamin E is a fat-soluble anti-oxidant which protects cell membranes.

Question60

Match List-I and List-II.

List-I	List-II
A. Valium	1. Antifertility drug
B. Morphine	2. Pernicious anaemia
C. Norethindrone	3. Analgesic
D. Vitamin B_{12}	4. Tranquiliser

Choose the correct answer from the option given below.
[24 Feb 2021 Shift 2]

Options:

A. (A-4), (B-3), (C-2), (D-1)

B. (A-4), (B-3), (C-1), (D-2)

C. (A-2), (B-4), (C-3), (D-1)

D. (A-1), (B-3), (C-4), (D-2)

Answer: B

Solution:

Solution:
(A) Valium - (4) Tranquilizer
A tranquilizer drug became a standard drug for the treatment of anxiety and one of most commonly prescribed drugs of all time.
(B) Morphine - (3) Analgesic
Morphine is effective for both acute and chronic pain and often usedbefore and after surgery.
(C) Norethindrone - (1) Antifertility drug
It is a form of progesterone, a female hormone important for regulating ovulation and menstruation.
(D) Vitamin B_{12} – (2) Pernicious anaemia
It is a nutrient that helps to keepour body blood cells and nerve cells healthy and help in making DNA.

Question61

Out of the following, which type of interaction is responsible for the stabilisation of α-helix structure of proteins?
[24 Feb 2021 Shift 1]

Options:

A. Ionic bonding

B. Hydrogen bonding

C. Covalent bonding

D. vander Waals forces

Answer: B

Solution:

Hydrogen bonding is responsible for stabilisation of alpha-helix structure of proteins.

Question62

A non-reducing sugar "A" hydrolyses to give two reducing monosaccharides. Sugar A is
[18 Mar 2021 Shift 1]

Options:

A. fructose

B. galactose

C. glucose

D. sucrose

Answer: D

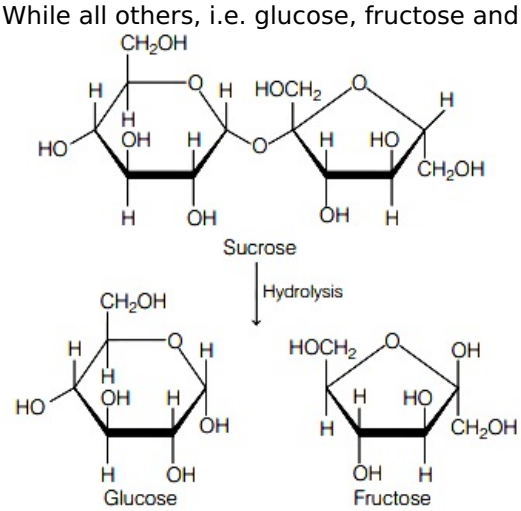
Solution:

A non-reducing sugar is one kind of carbohydrate that is not oxidised by a weak oxidising agent (an oxidising agent that oxidises aldehydes but not alcohols, such as the Tollen's reagent) in a basic aqueous solution.

$$\underset{\text{Sucrose(A)}}{C_{12}H_{22}O_{11}} + H_2O \longrightarrow \underset{\text{D – glucose}}{C_6H_{12}O_6} + \underset{\text{D – fructose}}{C_6H_{12}O_6}$$

(Non-reducingsugar)

While all others, i.e. glucose, fructose and galactose are reducing sugar



Thus, sugar (A) is sucrose.

Question63

$$\underset{\text{Sucrose}}{C_2H_{22}O_{11}} + H_2O \xrightarrow{\text{Enzyme A}} \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Fructose}}{C_6H_{12}O_6}$$

$$\underset{\text{Glucose}}{C_6H_{12}O_6} \xrightarrow{\text{Enzyme B}} 2\underset{\text{Ethanol}}{C_2H_5OH} + 2CO_2$$

In the above reactions, the enzyme A and enzyme B respectively are

[17 Mar 2021 Shift 2]

Options:

A. amylase and invertase

B. invertase and amylase

C. invertase and zymase

D. zymase and invertase

Answer: C

Solution:

Solution:
Invertase and zymase are enzyme A and enzyme B respectively. Invertase is the enzyme that catalyses the hydrolysis of sucrose with a resulting mixture of fructose and glucose, which is called inverted sugar. It cleaves the O − C bond.

$$\underset{\text{Sucrose}}{C_2H_{22}O_{11}} + H_2O \xrightarrow{\text{Invertase}} \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Fructose}}{C_6H_{12}O_6}$$

Zymase is an enzyme that catalyses the fermentation of sugar into ethanol and carbon dioxide.

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

Question64

Fructose is an example of
[17 Mar 2021 Shift 2]

Options:

A. pyranose

B. ketohexose

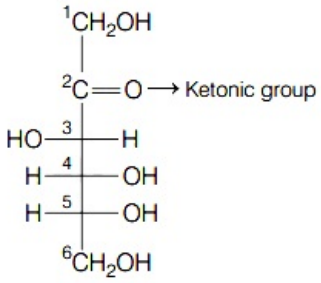
C. aldohexose

D. heptose

Answer: B

Solution:

Solution:
Fructose is an example of ketohexose is a class of sugars that contains six-carbon atoms and a ketonic group. Fructose has a ketonic group with six carbon atoms.
It contains five hydroxyl group and one ketonic group.
The structure of fructose is

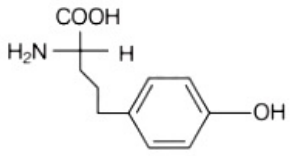


Question65

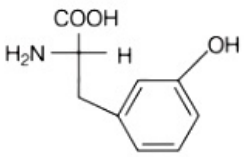
Which of the following is correct structure of tyrosine? [17 Mar 2021 Shift 1]

Options:

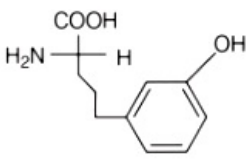
A.



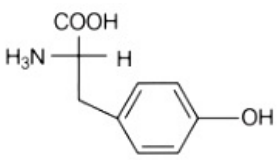
B.



C.



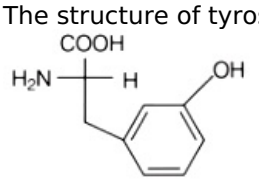
D.



Answer: B

Solution:

Solution:
The structure of tyrosine amino acid is



It is an example of non-essential amino acid which contains aromatic (phenolic) ring.

Question66

The secondary structure of protein is stabilised by [16 Mar 2021 Shift 2]

Options:

A. peptide bond

B. glycosidic bond

C. hydrogen bonding

D. van der Waals' forces

Answer: C

Solution:

Solution:
In secondary structure of protein, hydrogen bond is formed
between $-\overset{\overset{O}{\|}}{C}-$ and $-NH-$ groups of the peptide bond.
Peptide linkage is an amide formed between $-COOH$ group and $-NH_2$ group while connecting two amino acids.
The two monosaccharides are joined together by an oxide linkage formed by the loss of a water molecule is called glycosidic linkage.

Question67

Deficiency of vitamin K causes [18 Mar 2021 Shift 2]

Options:

A. increase in blood clotting time

B. increase in fragility of RBC's

C. cheilosis

D. decrease in blood clotting time

Answer: A

Solution:

Solution:
Vitamin K deficiency causes increase in blood clotting time because their blood does not have enough vitamin K to form a clot. The bleeding can occur anywhere i.e. inside or outside the body.
Note : Vitamin K related to blood factor.

Question68

Which among the following pair of vitamins is stored in our body relatively for longer duration?
[16 Mar 2021 Shift 1]

Options:

A. Thiamine and vitamin A

B. Vitamin A and vitamin D

C. Thiamine and ascorbic acid

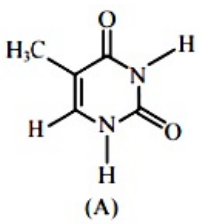
D. Ascorbic acid and vitamin D

Answer: B

Solution:

Vitamin A and vitamin D are stored in our body relatively for longer duration. These are water insoluble and soluble in fats and oils. Hence, these are called fat soluble vitamins.
Thiamine (vitamin B) and ascorbic acid (vitamin C) are water soluble vitamins and must be supplied regularly in diet. These vitamins are not stored in our body.

Question69



(A)

The compound 'A' is a complementary base of _____ in DNA stands.
[27 Jul 2021 Shift 1]

Options:

A. Uracil

B. Guanine

C. Adenine

D. Cytosine

Answer: C

Solution:

Solution:
Given structure is Thymine and Thymine being paired with adenine

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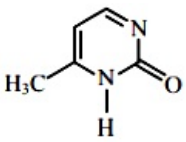
Question70

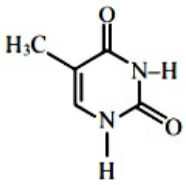
Which one of the following is correct structure for cytosine ? [25 Jul 2021 Shift 2]

Options:

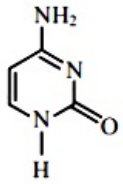
A.



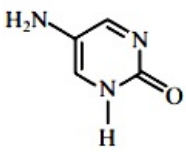
B.



C.



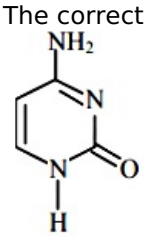
D.



Answer: C

Solution:

Solution:
The correct structure of cytosine



Question71

Thiamine and pyridoxine are also known respectively as : [22 Jul 2021 Shift 2]

Options:

A. Vitamin B_2 and Vitamin E

B. Vitamin E and Vitamin B_2

C. Vitamin B_6 and Vitamin B_2

D. Vitamin B_1 and Vitamin B_6

Answer: D

Solution:

Solution:
Vitamine- B_1 is also known as Thiamine while vitamin B-6 is known as Pyridoxine

---

Question72

Compound A gives D-Galactose and D-Glucose on hydrolysis. The compound A is : [27 Jul 2021 Shift 2]

Options:

A. Amylose

B. Sucrose

C. Maltose

D. Lactose

Answer: D

Solution:

Solution:
Lactose : It is a disaccharide of $\beta-$ D-Galactose and $\beta-$ D-Glucose with C_1 of galactose and C_4 of glucose link.
Lactose : β-D-Galactose $+\beta-$ D-Glucose

Question73

Identify the incorrect statement from the following [20 Jul 2021 Shift 1]

Options:

A. Amylose is a branched chain polymer of glucose

B. Starch is a polymer of α-D glucose

C. α-Glycosidic linkage makes cellulose polymer

D. Glycogen is called as animal starch

Answer: A

Solution:

Solution:
Amylose is a linear chain polymer of α-D-glucose while amylopectine is branched chain polymer of $\alpha - D$ glucose

---

Question74

Which one among the following chemical tests is used to distinguish monosaccharide from disaccharide ?
[27 Jul 2021 Shift 1]

Options:

A. Seliwanoff's test

B. Iodine test

C. Barfoed test

D. Tollen's test

Answer: C

Solution:

Solution:
Barford test is used for distinguish monosaccharide from disaccharide

---

Question75

Which one of the following compounds contain $\beta - C_1 - C_4$ glycosidic linkage ?
[31 Aug 2021 Shift 1]

Options:

A. Lactose

B. Sucrose

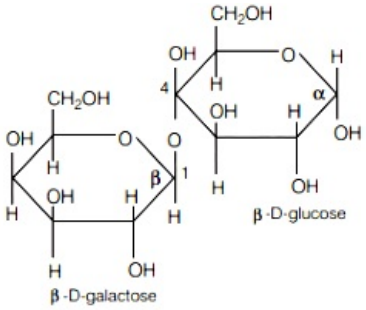
C. Maltose

D. Amylose

Answer: A

Solution:

Lactose contains $\beta - C_1 - C_4$ glycosidic linkage.
The linkage is between $C - 1$ of galactose and $C - 4$ of glucose. It's structure is as follows :



Hence, correct option is (a).

Question76

Hydrolysis of sucrose gives [27 Aug 2021 Shift 2]

Options:

A. $\alpha - D - (-)$-glucose and $\beta - D - (-)$-fructose

B. $\alpha - D - (+)$-glucose and $\beta - D - (+)$-fructose

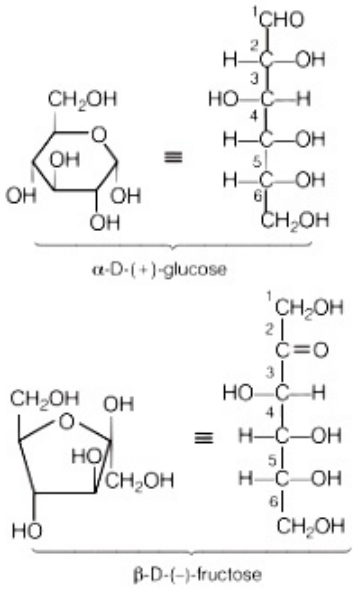
C. $\alpha - D - (-)$-glucose and $\beta D - (+)$-fructose

D. $\alpha - D - (+) -$ glucose and $\beta - D - (-)$-fructose

Answer: D

Solution:

Hydrolysis of sucrose gives,
Sucrose $+H_2O \rightleftharpoons \alpha - D - (+) -$ glucose $+\beta - D - (-) -$ fructose



Therefore, option (d) is correct answer.
'D' represents the orientation of hydroxyl group at the chiral carbon that is farthest from the highest oxidised carbon (aldehyde group in case of glucose and keto group in fructose) when the - OH group is on the right side, 'L' is used when - OH group is on the left side. (+) and (−) represents the direction of rotation of plane polarised light (+) is clockwise rotation and (−) is anticlockwise rotation.α-is used when - OH group at anomeric carbon is below the ring in Haworth projection, β is used when - OH group at anomeric carbon is above the rings in Haworth projection.

Question77

Given below are two statements : One is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A) Sucrose is a disaccharide and a non-reducing sugar.
Reason (R) Sucrose involves glycosidic linkage between C_1 of β− glucose and C_2 of α - fructose. Choose the most appropriate answer from the options given below.
[26 Aug 2021 Shift 2]

Options:

A. Both (A) and (R) are true but (R) is not thecorrect explanation of (A).

B. (A) is false but (R) is true.

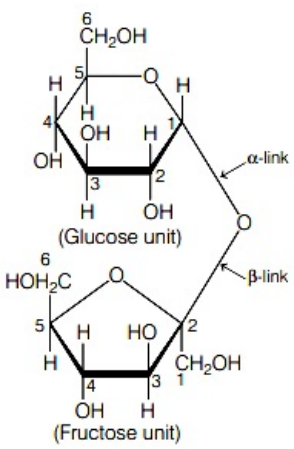
C. (A) is true but (R) is false.

D. Both (A) and (R) are true and (R) is the correctexplanation of (A).

Answer: C

Solution:

Solution:
Assertion is true but Reason is false. Sucrose is formed by linkage of C_1 of α - D glucose and C_2 of β − D fructose. The glycosidic bond in sucrose is formed between reducing ends of both glucose and fructose.
Sucrose is a disaccharide and a non-reducing sugar as it contains no free —CHO group (Anomeric carbon of both monosaccharides are involved in formation of glycosidic bond). The structure is as follows



Question78

Which of the following is not an example of fibrous protein ?
[31 Aug 2021 Shift 2]

Options:

A. Keratin

B. Albumin

C. Collagen

D. Myosin

Answer: B

Solution:

Solution:
Insulin and albumin are globular protein. Fibrous proteins are generally composed of long and narrow strands and have structural role while globular proteins generally have more compact and rounded shape and involved in metabolic functions.

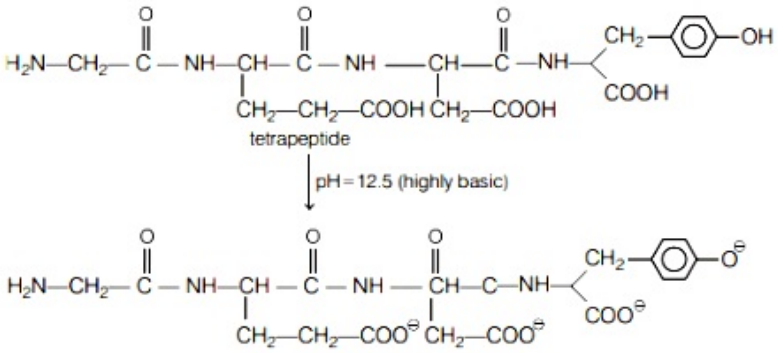
Question79

The total number of negative charge in the tetrapeptide, Gly - Glu - Asp - Tyr, at pH 12.5 will be ..... . (Integer answer)
[26 Aug 2021 Shift 1]

Answer: 4

Solution:

The structures of tetrapeptide **Gly-Glu-Asp-Tyr** is as follows



(All protons (H^+) from carboxylic group and phenol are lost neutralised in basic medium)
Total negative charge = 4.

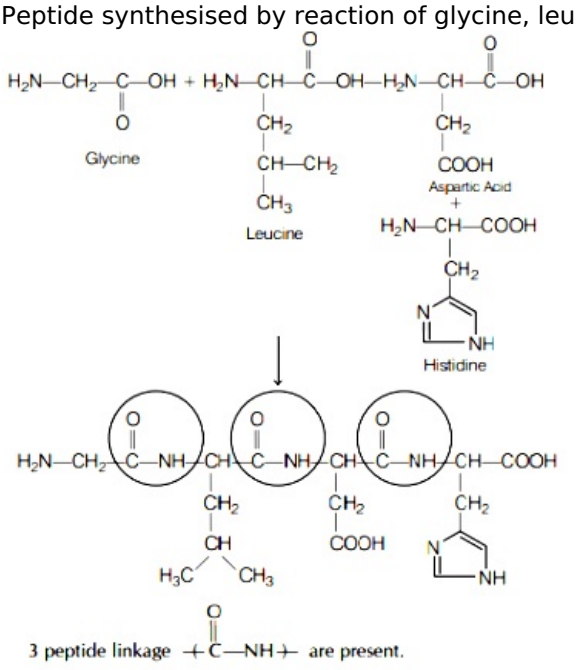
Question80

A peptide synthesised by the reactions of one molecule each of glycine, leucine, aspartic acid and histidine will have.....
peptide linkages.
[1 Sep 2021 Shift 2]

Answer: 3

Solution:

Peptide synthesised by reaction of glycine, leucine, aspartic acidand histidine is as follows.



Hence, answer is 3.

Question81

Which of the following statement is not true for glucose? [Jan. 08,2020 (II)]

Options:

A. Glucose exists in two crystalline forms α and β

B. Glucose gives Schiff's test for aldehyde

C. Glucose reacts with hydroxylamine to form oxime The penta acetate of glucose does not

D. react with hydroxylamine to give oxime

Answer: B

Solution:

Solution:
Glucose exists in cyclic form in which aldehyde group is not free, therefore it does not give Schiff's test.

Question82

Two monomers in maltose are: [Jan. 08, 2020 (II)]

Options:

A. α -D-glucose and β − D -glucose

B. α -D-glucose and α -D-galactose

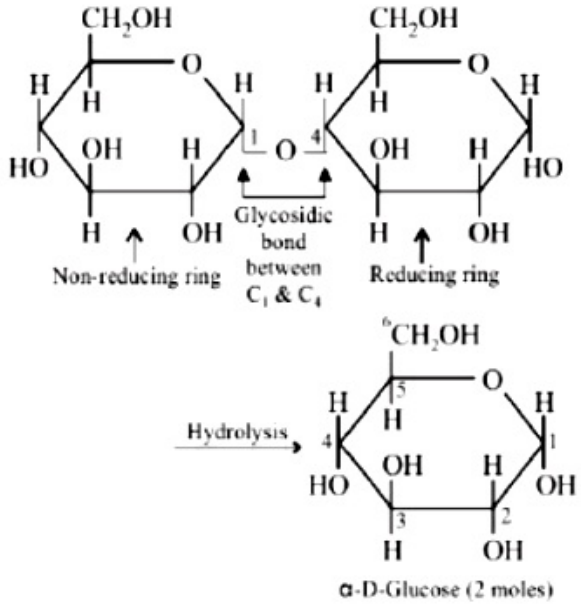
C. α -D-glucose and α -D-fructose

D. α− D-glucose and α -D-glucose

Answer: D

Solution:

Maltose on hydrolysis gives two moles of α -D-glucose.



Question83

Which of the following statements is correct? [Jan. 07,2020 (II)]

Options:

A. Gluconic acid can form cyclic (acetal/hemiacetal) structure

B. Gluconic acid is a dicarboxylic acid

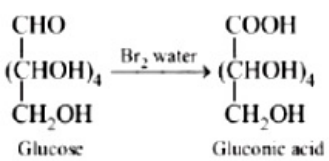
C. Gluconic acid is a partial oxidation product of glucose

D. Gluconic acid is obtained by oxidation of glucose with HNO_3

Answer: C

Solution:

Solution:
Gluconic acid is obtained by partial oxidation of glucose by mild oxidising agent e.g. Tollen's reagent, Fehling solution, Br_2 water.



Gluconic acid can not form hemiacetal or acetal.

Question84

The mass percentage of nitrogen in histamine is _____.
[NV, Jan. 09,2020(I)]

Answer: 37.84

Solution:

Molecular formula of histamine is $C_3H_9N_3$
Molecular mass of histamine
$= 5 \times 12 + 9 \times 1 + 3 \times 14 = 111$
Mass percentage of nitrogen in histamine
$= \frac{42}{111} \times 100 - 37.84\%$

Question85

Match the following:
(i) Riboflavin (a) Beriberi
(ii) Thiamine (b) Scurvy
(iii) Pyridoxine (c) Cheilosis
(iv) Ascorbic acid (d) Convulsions
[Jan. 07,2020(I)]

Options:

A. (i) – (a), (ii) – (d), (iii) – (c), (iv) – (b)

B. (i)-(c), (ii) –(d), (iii) – (a), (iv) – (b)

C. (i) – (c), (ii) – (a), (iii) – (d), (iv) – (b)

D. (i) – (d), (ii) – (b), (iii) – (a), (iv) – (c)

Answer: C

Solution:

Vitamins	Deficiency Diseases
Vitamin B_1 (thiamine)	Beribcri
Vitamin B_2 (riboflavin)	Cheilosis
Vitamin B_6 (pyridoxine)	Convulsions
Vitamin C (ascorbicacid)	Scurvy

Question86

Which one of the following statements is not true? [Sep. 06,2020 (II)]

Options:

A. Lactose contains α -glycosidic linkage between C_1 of galactose and C_4 of glucose.

B. Lactose is a reducing sugar and it gives Fehling's test.

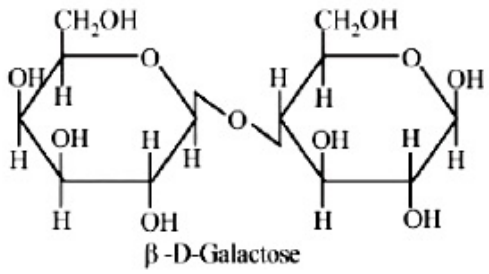
C. Lactose ($C_{11}H_{22}O_{11}$) is a disaccharide and it contains 8 hydroxyl groups.

D. On acid hydrolysis, lactose gives one molecule of D(+) -glucose and one molecule of D(+) -galactose

Answer: A

Solution:

Lactose contains β -glycosidic linkage between C_1 of galactose and C_4 of glucose.



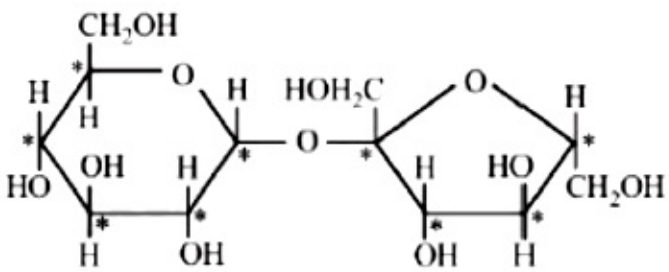
β -D-Galactose

Question87

The number of chiral carbons present in sucrose is _____. [NV, Sep. 05,2020 (II)]

Answer: 9

Solution:



No. of chiral centres = 9

Question88

What are the functional groups present in the structure of maltose? [Sep. 04,2020(I)]

Options:

A. One ketal and hemiketal

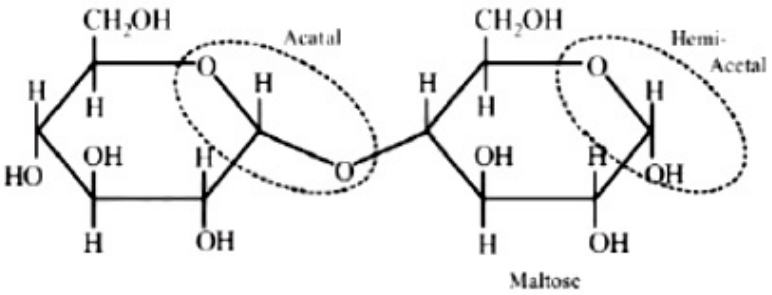
B. Two acetals

C. One acetal and one hemiacetal

D. One acetal and one ketal

Answer: C

Solution:



One acetal and one hemi acetal group is present in maltose.

Question89

Consider the following reactions :

(i) Glucose + ROH $\xrightarrow{\text{dry HCl}}$ Acetal $\xrightarrow[(CH_3CO)_2O]{\text{x eq . of}}$ acetyl derivative

(i) Glucose $\xrightarrow{Ni / H_2}$ A $\xrightarrow[(CH_3CO)_2O]{\text{y eq . of}}$ acetyl derivative

(i) Glucose + $\xrightarrow[(CH_3CO)_2O]{\text{z eq . of}}$ acetyl derivative

'x', 'y' and 'z' in these reactions are respectively.
[Sep. 02, 2020 (I)]

Options:

A. 5, 4 & 5

B. 4, 6 & 5

C. 4, 5 & 5

D. 5, 6 & 5

Answer: B

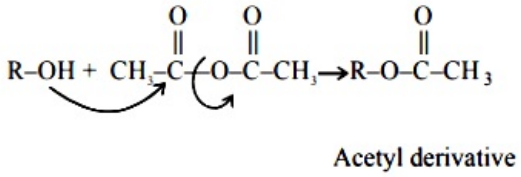
Solution:

(i) Glucose + dry HCl $\xrightarrow{ROH}$ Acetal $\xrightarrow[(CH_3CO)_2O]{x\,Eq.}$ acetyl derivative

(i) Glucose $\xrightarrow{Ni/H_2}$ A $\xrightarrow[(CH_3CO)_2O]{y\,Eq}$ acetyl derivative

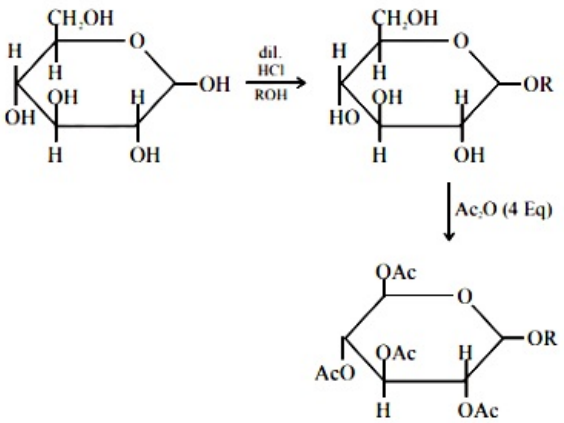
(i) Glucose + $\xrightarrow[(CH_3CO)_2O]{z\,Eq}$ acetyl derivative

due to presence of –OH group in Glucose the reaction is

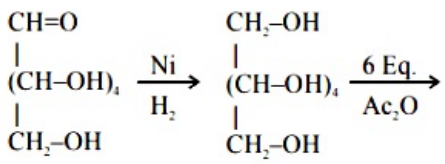


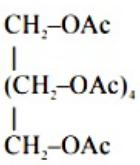
Acetyl derivative

so for (i)

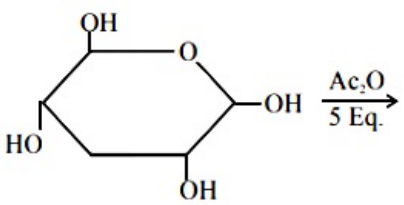


(ii)

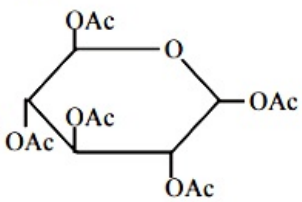




(iii)



Glucose pentacetase



Question90

The correct observation in the following reactions is:

Sucrose $\xrightarrow[\text{Cleavage(Hydrolysis)}]{\text{Glycosidic bond}}$ **A + B** $\xrightarrow[\text{reagent}]{\text{Seliwanoff's}}$ **?**

[Sep. 02,2020 (II)]

Options:

A. Formation of blue colour

B. Gives no colour

C. Formation of red colour

D. Formation of violet colour

Answer: C

Solution:

Seliwanoff reagent → [Resorcinol + Conc. HCl] It is used to distinguish aldoses and ketoses. Ketoses show red colour whereas aldoses show light pink colour with Seliwanoff Reagent.

Question91

Which of the following is not an essential amino acid? [Sep. 05,2020(I)]

Options:

A. Tyrosine

B. Leucine

C. Valine

D. Lysine

Answer: A

Solution:

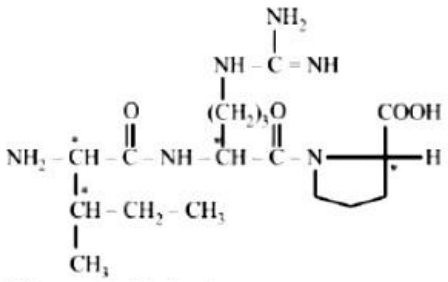
Solution:
Tyrosine is a non-cssential amino acid.

Question92

The number of chiral carbons (s) present in peptide, Ile Age-Pro, is _____. [NV, Sep. 05, 2020(I)]

Answer: 4

Solution:



* Represents chiral centre.

Question93

Which of the following will react with $CHCl_3$ + alc. KOH ? [Sep. 04,2020 (I)]

Options:

A. Adenine and proline

B. Thymine and proline

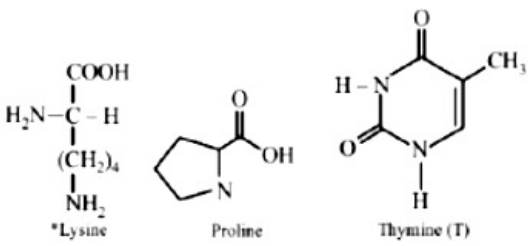
C. Adenine and lysine

D. Adenine and thymine

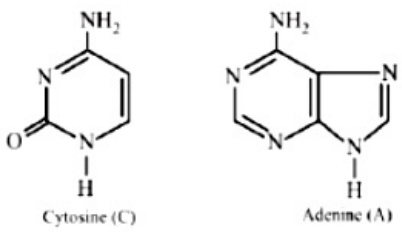
Answer: C

Solution:

Solution:
Compounds having 1° amine give carbylamine reaction with $CHCl_3$ and alc. KOH .



*Lysine Proline Thymine (T)



Cytosine (C) Adenine (A)

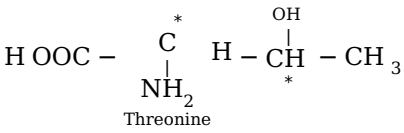
Question94

The number of chiral centres present in threonine is _____. [NV, Sep.04,2020(II)]

Answer: 2

Solution:

Solution:



No. of chiral centres = 2

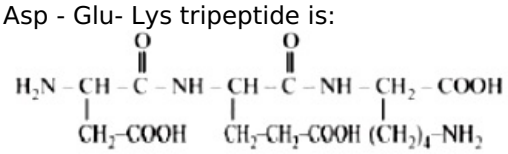
Question95

The number of ;C = O groups present in a tripeptide Asp - Glu - Lys is _____. [NV,Sep.03,2020(II)]

Answer: 5

Solution:

Solution:
Asp - Glu- Lys tripeptide is:



No. of CO group -5

Question96

Among the following compounds most basic amino acid is: [Jan.12,2019(I)]

Options:

A. Asparagine

B. Lysine

C. Scrine

D. Histidine

Answer: B

Solution:

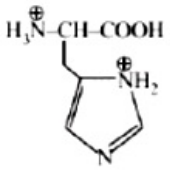
Solution:
Lysine

Question97

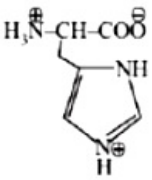
The correct structure of histidine in a strongly acidic solution (pH − 2) is :
[Jan. 12, 2019 (II)]

Options:

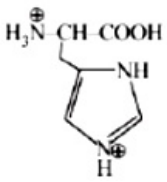
A.



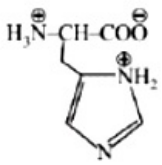
B.



C.

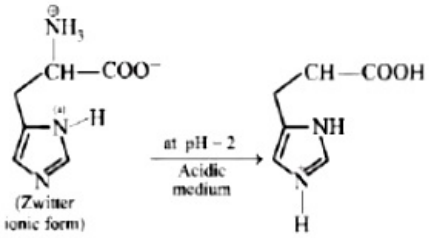


D.



Answer: C

Solution:



Note that l p of electrons on N labelled as N (a) are involved in delocalisation, hence not available for protonation.

Question98

The increasing order of pKa of the following amino acids in aqueous solution is:
Gly Asp Lys Arg

[Jan. 9,2019 (I)]

Options:

A. Asp < Gly < Arg < Lys

B. Gl y < Asp < Arg < Lys

C. Asp < Gly < Lys < Arg

D. Arg < Lys < Gl y < Asp

Answer: C

Solution:

Solution:
Structure of the given α -amino acids are:

$H_3N - CH_2 - COO^-$ (Glycine(Gly))

$HOOC - CH_2 - \underset{\downarrow}{C}H - COO^-$ (NH_3) (Aspartic acid(Asp))

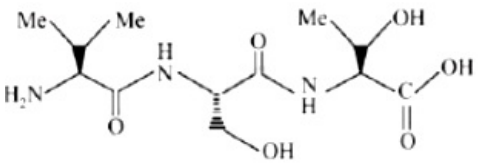
$H_2N - (CH_2)_4 - \underset{\downarrow}{C}H - COO^-$ (NH_3) (Lysine(Lys))

$H_2N - \overset{\overset{NH}{\|}}{C} - NH - (CH_2)_3 - \underset{\downarrow}{C}H - COO^-$ (NH_3) (Arginine(Arg))

Here, aspartic acid is acidic, glycine is neutral, while lysine and arginine are basic amino acids. Also, arginine is more basic due to stronger basic functional groups. ∴ The order of pK_a value is directly proportional to the basic strength of amino acids, thus Arg > Lys > Gly > Asp.

Question99

The correct sequence of amino acids present in the tripeptide given below is:



[Jan. 9,2019 (II)]

Options:

A. Val-Ser-Thr

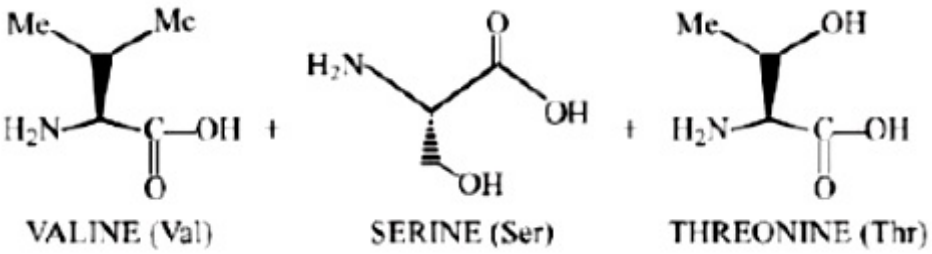
B. Thr-Ser-Val

C. L Leu $-$ Ser $-$ V al

D. T hr $-$ Ser $-$ L_{cu}

Answer: A

Solution:

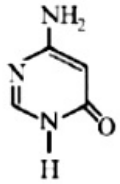


Question100

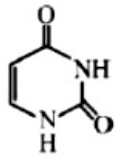
Among the following compounds, which one is found in RNA? [Jan. 11, 2019 (I)]

Options:

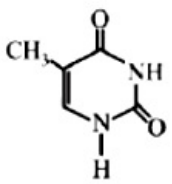
A.



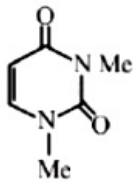
B.



C.



D.



Answer: B

Solution:

Solution:
RNA contains adenine (A), guanine (g), cytosine (c) and uracil (u).
(1) is cytosine, found in RNA and DNA, both.
(2) is uracil, found in RNA only.
(3) is thymine, found in DNA only.
(4) is not a pyrimidine, i.e., nat a constituents of RNA and DNA.

Question101

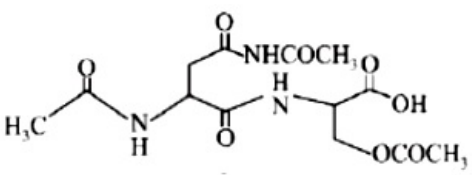
The correct structure of product 'P' in the following reaction is:

Asn - Ser + $\underset{\text{(excess)}}{(CH_3CO)_2O} \xrightarrow{NEt_3}$ **P**

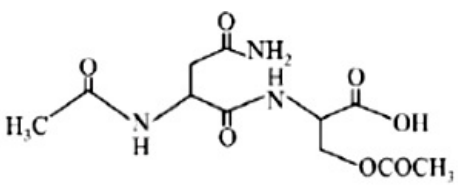
[Jan. 10, 2019(I)]

Options:

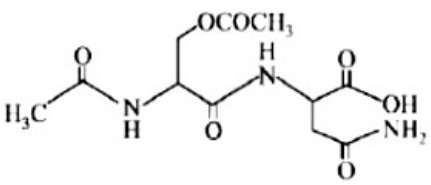
A.



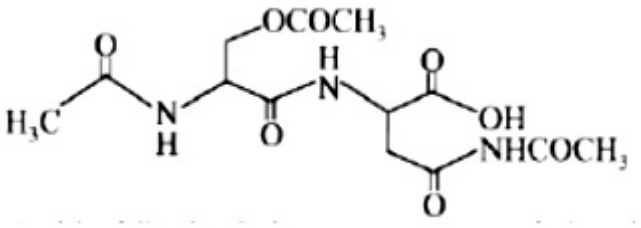
B.



C.

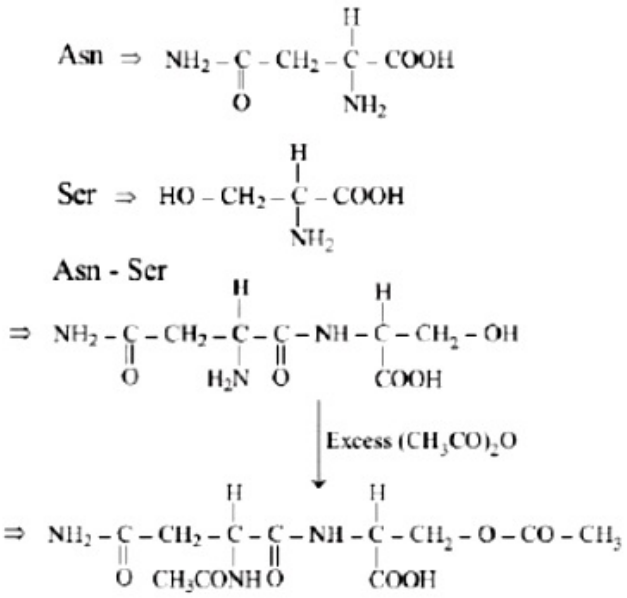


D.



Answer: B

Solution:



Question102

Glucose and Galactose are having identical configuration in all the positions except position.
[April 12, 2019 (I)]

Options:

A. C − 3

B. C − 4

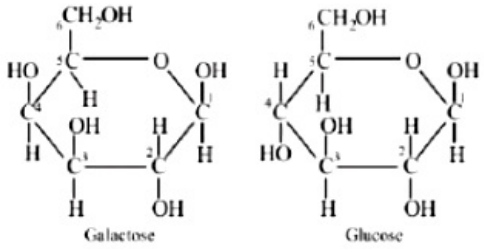
C. C − 2

D. C − 5

Answer: B

Solution:

Solution:
Galactose and glucose are C_4 epimers.



Question103

Which of the given statements is INCORRECT about glycogen ? [April 12, 2019 (II)]

Options:

A. It is a straight chain polymer similar to amylose.

B. Only α -linkages are present in the molecule.

C. It is present in animal cells.

D. It is present in some yeast and fungi.

Answer: A

Solution:

Solution:
Structure of glycogen is similar to amylopectin. It is found in yeast and fungi and stored in animal body. It contains α -glycosidic linkages.

Question104

Amylopectin is composed of: [April 10, 2019(I)]

Options:

A. α − D -glucose ,$C_1 - C_4$ and $C_1 - C_6$ linkages

B. β − D -glucosc, $C_1 - C_4$ and $C_2 - C_6$ linkages

C. β − D -glucose, $C_1 - C_4$ and $C_1 - C_6$ linkages

D. α− D-glucose, $C_1 - C_4$ and $C_2 - C_6$ linkages

Answer: A

Solution:

Solution:
Starch is a polymer of α -D-glucose. It has two components.
(i) Amylose, which has only α − 1, 4 -glycosidic linkage and is a linear polymer.

(ii) Amylopectin, which has $\alpha - 1, 6$ -glycosidic linkage in addition to $\alpha - 1, 4$ -glycosidic linkage and is a crosslinked polymer.

Question105

Number of stereo centers present in linear and cyclic structures of glucose are respectively:
[April 10,2019 (II)]

Options:

A. 5 & 4

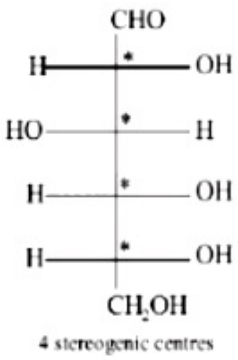
B. 4 & 4

C. 5 & 5

D. 4 & 5

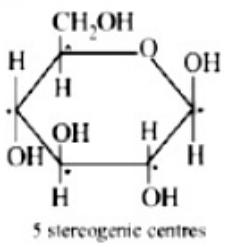
Answer: D

Solution:



4 stereogenic centres

Cyclic structure of glucose,



5 stereogenic centres

Question106

Which of the following statements is not true about sucrose?
[April 9, 2019(I)]

Options:

A. It is a non reducing sugar

B. The glycosidic linkage is present between C_1 of α glucose and C_1, of β -fructose

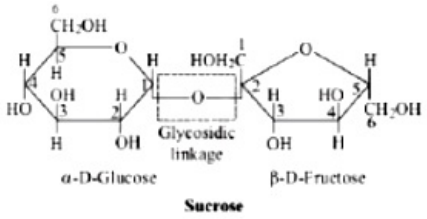
C. It is also named as invert sugar

D. On hydrolysis, it produces glucose and fructose

Answer: B

Solution:

Solution:
Sucrose contains glycosidic link between C_1 of $\alpha - D$ glucose and C_2 of $\beta - D$ -fructose.
$C_{12}H_{22}O_{11} + H_2O \longrightarrow$ Glucose + Fructose



Sucrose

Question107

Which of the following statements is not true about sucrose? [April 9, 2019 (I)]

Options:

A. It is a non reducing sugar

B. The glycosidic linkage is present between C_1 of α glucose and C_1 of β -fructose

C. It is also named as invert sugar

D. On hydrolysis, it produces glucose and fructose

Answer: B

Solution:

Solution:
Sucrose $\xrightarrow{H_2O} \alpha - D$ - glucose $+\beta - D$ - fructose also named as invert sugar and it is a example of non-reducing sugar
The glycosidic linkage is present between C_1 of α-glucose and C_2 of β-fructose.
In sucrose, the components glucose and fructose are linked via an ether bond between C_1 on the glucosyl subunit and C2 on the fructosyl unit. The bond is called a glycosidic linkage.

Question108

Maltose on treatment with dilute HCl gives: [April 8,2019(1)]

Options:

A. D-Glucose and D-Fructose

B. D-Fructose

C. D-Galactose

D. D-Glucose

Answer: D

Solution:

Solution:
(a) Fehling solution : $CuSO_4$ + Sod. - Pot. tartarate (Rochelle salt) gives red ppt. of Cu_2O with glucose and fructose both.
(b) Barfoed reagent: 7%$(CH_3COO)_2Cu$ + 1%CH_3COOH + 92%H_2O gives red ppt. of Cu_2O with both.
(c) Benedict reagent: $CuSO_4$ + Sod. citrate + Na_2CO_3 also gives red ppt. of Cu_2O with both.
(d) Seliwanoff's reagent: Resorcinol in conc. HCl gives red colour with both, but a ketose (fructose) reacts more quickly than an aldose (glucose).

Question109

The peptide that gives positive ceric ammonium nitrate and carbylamine tests is:
[April 9, 2019 (II)]

Options:

A. Ser-Lys

B. Gl n − Asp

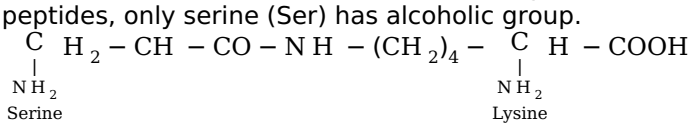
C. Lys - Asp

D. A sp − Gin

Answer: A

Solution:

Solution:
Ceric ammonium nitrate test is used for detecting alcohols, while carbylamine test is for primary amines. Among the given peptides, only serine (Ser) has alcoholic group.



Question110

Which of the following statements is not true about RNA?
[April 12, 2019 (I)]

Options:

A. It controls the synthesis of protein.

B. It has always double stranded helix structure.

C. It usually does not replicate.

D. It is present in the nucleus of the cell.

Answer: B

Solution:

Solution:
RNA has a single helix structure, whereas, DNA has a double helix structure.

Question111

Glucose on prolonged heating with HI gives: [2018]

Options:

A. n -Hexane

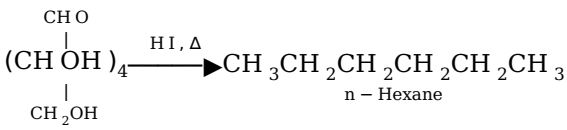
B. 1 - Hexene

C. Hexanoic acid

D. 6 -iodohexanal

Answer: A

Solution:



Question112

Among the following, the incorrect statement is: [Online April 16, 2018]

Options:

A. Cellulose and amylose have 1,4 -glycosidic linkage

B. Lactose contains β -D-galactose and β -D-glucose

C. Maltose and lactose have 1,4 -glycosidic linkagc

D. Sucrose and amylose have 1,2 -glycosidic linkage

Answer: D

Solution:

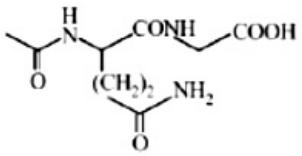
In amylose 1, 4 − α -glycosidic linkage is present.

Question113

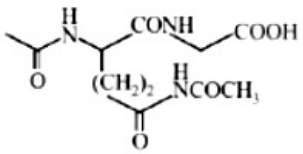
The dipeptide, Gln-Gly, on treatment with CH_3COCl followed by aqueous work up gives:
[Online April 15,2018(II)]

Options:

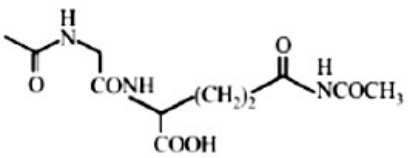
A.



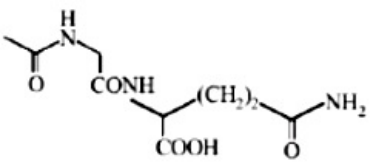
B.



C.



D.



Answer: A

Solution:

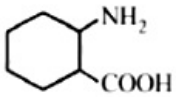
Solution:
Amino group of glutamine is acetylated while amide group of glutamine is not acetylated.
Note : Acetylation of amide requires activation of amides and\/or acyl donors, since the nitrogen atom of amides is less basic than that of the corresponding amines due to amide resonance.

Question114

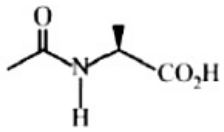
Which of the following will not exist in zwitter ionic form at pH = 7 ?
[Online April 15, 2018(I)]

Options:

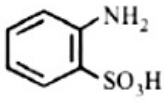
A.



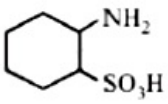
B.



C.



D.



Answer: B

Solution:

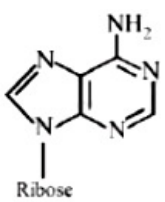
Solution:
The N atom of amide is not basic so it will not exist in zwitter ionic form at pH 7.0.

Question115

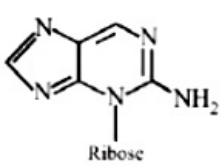
Which of the following is the correct structure of adenosine? [Online April 15,2018(I)]

Options:

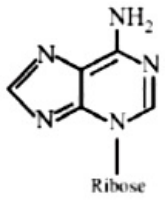
A.



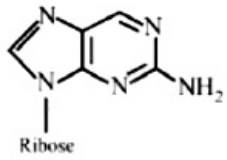
B.



C.



D.



Answer: A

Solution:

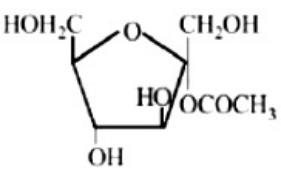
Solution:

Question116

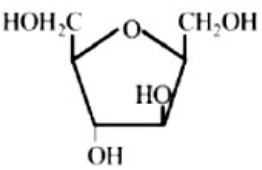
Which of the following compounds will behave as a reducing sugar in an aqueous KOH solution?
[2017]

Options:

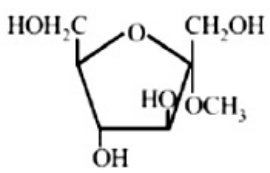
A.



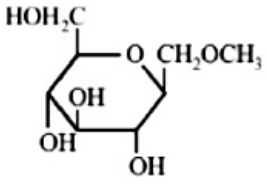
B.



C.

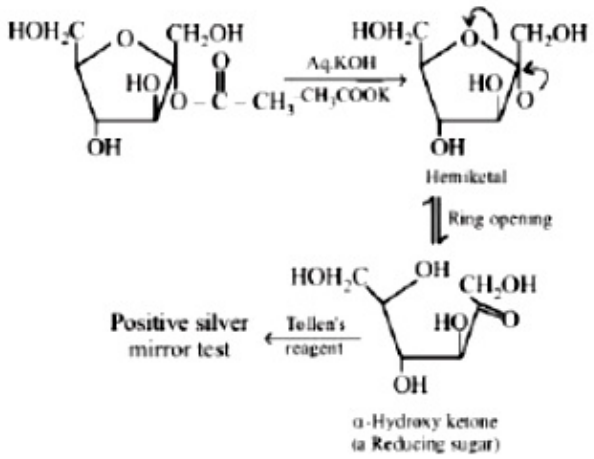


D.



Answer: A

Solution:



Question117

The incorrect statement among the following is: [Online April 9, 2017]

Options:

A. α -D-glucose and β -D-glucose are anomers.

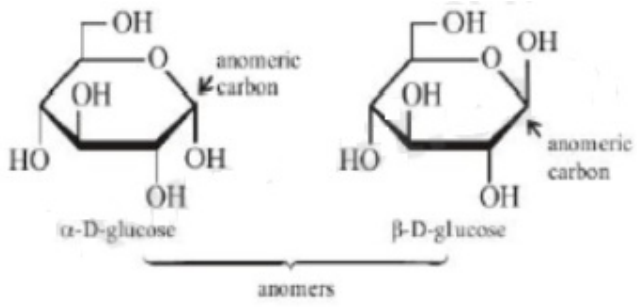
B. α -D-glucose and β -D-glucose are enantiomers.

C. Cellulose is a straight chain polysaccharide made up of only β -D-glucose units.

D. The penta acetate of glucose does not react with hydroxyl amine.

Answer: B

Solution:



Question118

Among the following, the essential amino acid is:
[Online April 8,2017]

Options:

A. Alanine

B. Valine

C. Aspartic acid

D. Serine

Answer: B

Solution:

Solution:
Those amino acids that cannot be synthesized in our body and must be supplied in diet is called essential amino acid for ex. valine, histidine, isoluecine etc.

Question119

Observation of "Ruhemann's purple" is a confirmatory test for the presence of:
[Online April 10, 2016]

Options:

A. Starch

B. Reducing sugar

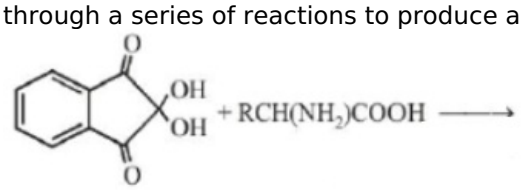
C. Protein

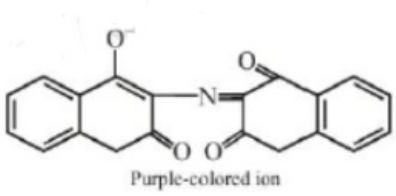
D. Cupricion

Answer: C

Solution:

Solution:
Ninhydrin is often used to detect $\alpha-$ amino acids and also free amino and carboxylic acid groups on proteins and peptides. When about $0.5 \mathrm{mL}$ of a 0.1% solution of ninhydrin is boiled for one or two minutes with a few mL of dilute amino acid or protein solution, a blue color develops. Ninhydrin degrades amino acids into aldehydes, ammonia, and CO_2 through a series of reactions to produce an intensely blue or purple pigment, sometimes called Ruhemann's purple.





Purple-colored ion

Question120

Thiol group is present in:
[2016]

Options:

A. Cysteine

B. Methionine

C. Cytosine

D. Cystine

Answer: A

Solution:

Solution:
Among 20 naturally occuring amino acids "cysteine" has ' $-SH$ ' or thiol functional group.
⇒ General formula of amino acid
$H_2N-\underset{\underset{R}{|}}{CH}-COOH$
⇒ Value of $R=-CH_2-SH$ in cysteine.

Question121

Complete hydrolysis of starch gives:
[Online April 10,2015]

Options:

A. glucose only

B. galactose and fructose in equimolar amounts

C. glucose and galactose in equimolar amounts

D. glucose and fructose in equimolar amounts

Answer: A

Solution:

Solution:
Starch is a mixture of amylose \& amylopectin polysaccharides and monomer is glucose. Thus on complete hydrolysis it gives only glucose.

Question122

Accumulation of which of the following molecules in the muscles occurs as a result of vigorous exercise ?
[Online April 11, 2015]

Options:

A. Glycogen

B. Glucose

C. Pyruvic acid

D. L -lactic acid

Answer: D

Solution:

Solution:

$$\underset{\text{stored in the form of Glycogen}}{\text{Glucose}} \xrightarrow{\text{(does not need oxygen; need only enzymes)}} \underset{\downarrow}{\text{Pyruvic acid}} \xrightarrow{O_2} CO_2 + H_2O$$
Lactic acid

During vigorous exercise sufficient oxygen is not available to meet the energy demand, so energy is derived through conversion of pyruvic acid to lactic acid.

Question123

Which of the vitamins given below is water soluble?
[2015]

Options:

A. Vitamin E

B. Vitamin K

C. Vitamin C

D. Vitamin D

Answer: C

Solution:

Solution:
Water soluble vitamins dissolve in water and are not stored by the body. The water soluble vitamins include the vitamin B-complex group and vitamin C.

Question124

Which of the following will not show mutarotation?
[Online April 12,2014]

Options:

A. Maltose

B. Lactose

C. Glucose

D. Sucrose

Answer: D

Solution:

Solution:
Sucrose does not contain a free aldehydic or ketonic group, hence it does not show mutarotation.

Question125

Which one of the following bases is not present in DNA? [2014]

Options:

A. Quinoline

B. Adenine

C. Cytosine

D. Thymine

Answer: A

Solution:

Solution:
DNA contains ATGC bases Quinoline is not present in DNA or RNA.

Question126

The reason for double helical structure of DNA is the operation of: [Online April 19, 2014]

Options:

A. Electrostatic attractions

B. van der Waals forces

C. Dipole- Dipole interactions

D. Hydrogen bonding

Answer: D

Solution:

Solution:
The two polynucleotide chains of DNA molecules are twisted around a common axis but run in opposite directions to form a right handed helix. The two chains are joined together by specific hydrogen bonds. AdenineThymine (two hydrogen bonds) and cytosine-guanine (threc hydrogen bonds)

Question127

Among the following organic acids, the acid present in rancid butter is: [Online April 19, 2014]

Options:

A. Pyruvic acid

B. Lacticacid

C. Butyric acid

D. Acetic acid

Answer: C

Solution:

Solution:
Butyric acid, also known as butanoic acid is found in milk, and butter and is a product of anaerobic fermentation. It has an unpleasant smell and acrid taste.

Question128

Synthesis of each molecule of glucose in photosynthesis involves : [2013]

Options:

A. 18 molecules of ATP

B. 10 molecules of ATP

C. 8 molecules of ATP

D. 6 molecules of ATP

Answer: A

Solution:

$6CO_2 + 12N\,ADPH + 18AT\,P \longrightarrow C_6H_{12}O_6 + 12N\,ADP + 18ADP$

Question129

Natural glucose is termed D-glucose because : [Online April 23, 2013]

Options:

A. −OH on the second carbon is on the right side in Fischer projection

B. −OH on the sixth carbon is on the right side in Fischer projection.

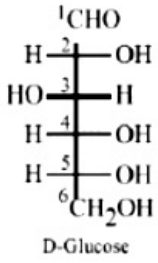
C. − OH on the fifth carbon is on the right side in Fischer projection.

D. It is dextrorotatory.

Answer: C

Solution:

Solution:
Fischer gave the prefix "D" to compounds whose bottom chiral has its OH to the right. So natural glucose is called D-glucose or dextrose. Structure of D -Glucose :



D-Glucose

Question130

Which of the following statement is not correct? [Online April 25,2013]

Options:

A. Amylopectin is a branched polymer of α - glucose.

B. Cellulose is a linear polymer of β -glucose

C. Glycogen is the food reserve of plants

D. All proteins are polymers of α - amino acids.

Answer: C

Solution:

Solution:
Glycogen is called animal starch and is found in all animal cells. It constitutes the reserve food material.

Question131

Glycosidic linkage is actually an : [Online April 23,2013]

Options:

A. Carbonyl bond

B. Ether bond

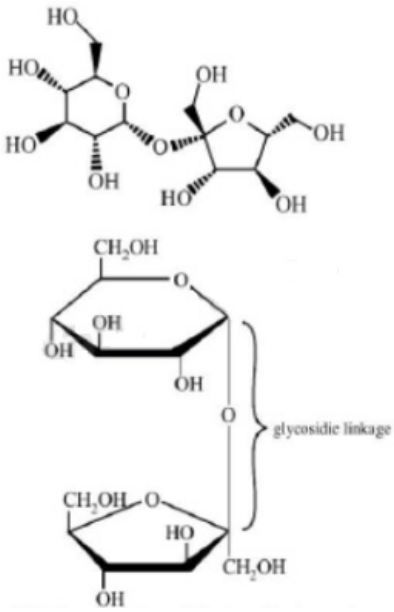
C. Ester bond

D. Amide bond

Answer: B

Solution:

Solution:
Glycosidic linkage is actually an ether bond as the linkage forming the rings in an oligosaccharide or polysaccharide is not just one bond, but the two bonds sharing an oxygen atom e.g. sucrose



Question132

Which of the following enzyme converts starch into maltose? [Online April 9, 2013]

Options:

A. Diastase

B. Maltase

C. Zymase

D. Invertase

Answer: A

Solution:

Solution:
Maltose is obtained by partial hydrolysis of starch by the enzyme diastase present in malt.

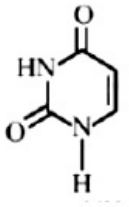
$$2(C_6H_{10}O_5)_n + nH_2O \xrightarrow{\text{Diastase}} nC_6H_{12}O_6(\text{maltose})$$

Question133

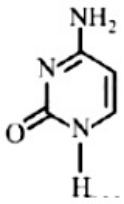
Which of the following structures represents thymine? [Online April 22, 2013]

Options:

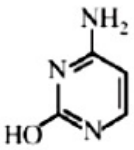
A.



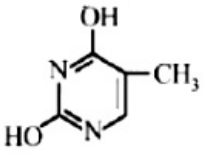
B.



C.



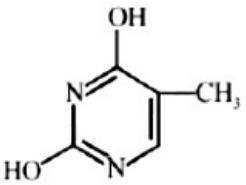
D.



Answer: D

Solution:

Solution:
The correct structure of thymine is



Thymine (T)

Question134

Among the following vitamins the one whose deficiency causes rickets (bone deficiency) is [Online April 25,2013]

Options:

A. Vitamin A

B. Vitamin B

C. Vitamin D

D. Vitamin C

Answer: C

Solution:

Solution:
Deficiency of vitamin D causes rickets.

Question135

Which of the following compounds can be detected by Molisch's test? [2012]

Options:

A. Nitro compounds

B. Sugars

C. Amines

D. Primary alcohols

Answer: B

Solution:

Solution:
Molisch's test : This is a general test for carbohydrates. One or two drops of alcoholic solution of α -naphthol is added to $2\mathrm{mL}$ glucose solution, $1\mathrm{mL}$ of conc. H_2SO_4 solution is added carefully along the sides of the test-tube. The formation of a violet ring at the junction of two liquids confirms the presence of a carbohydrate or sugar.

Question136

Amylopectin is a polymer of [Online May 12, 2012]

Options:

A. $\alpha - D -$ glucose

B. amino acid

C. $\beta - D -$ glucose

D. amylase.

Answer: A

Solution:

Solution:
Amylopectin is a polymer of α -D-glucose.

Question137

Which of the following is a non-reducing sugar? [Online May 19,2012]

Options:

A. Lactose

B. Fructose

C. Sucrose

D. Maltose

Answer: C

Solution:

Solution:
Sucrose is a non-reducing sugar as it does not reduce Fehling reagent and Tollen's reagent.

Question138

Which one of the following statements is correct? [2012]

Options:

A. All amino acids except lysine are optically active

B. All amino acids are optically active

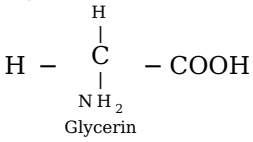
C. All amino acids except glycine are optically active

D. All aminoacids except glutamicacids are optically active

Answer: C

Solution:

Solution:
With the exception of glycine all other amino acids have different functional groups (atom) on the central tetrahedral alpha carbon.



Question139

All of the following statements apply to proteins except [Online May 7,2012]

Options:

A. Proteins generally have no definite melting point

B. Proteins contain the grouping $-CON H$

C. Proteins have high molecular weight

D. Proteins can only contain the elements C, H , O and N .

Answer: D

Solution:

Solution:
Statement (d) is not correct. Some proteins also contain S, along with C, H , O and N .

Question140

Which of the following statements is correct? [Online May 26, 2012]

Options:

A. RNA controls the synthesis of proteins.

B. The sugar present in DNA is D-(-)-ribose.

C. RNA has double stranded α -helix structure.

D. DNA mainly occurs in the cytoplasm of the cell.

Answer: A

Question141

Biuret test is not given by [2010]

Options:

A. carbohydrates

B. polypeptides

C. urea

D. proteins

Answer: A

Solution:

Solution:
Biuret test produces violet colour on addition of dilute $CuSO_4$ to alkaline solution of a compound containing peptide linkage. Polypeptides, proteins and urea have $-\overset{\underset{o}{||}}{CO}-NH-$ (peptide) linkage, while carbohydrates have glycosidic llinkages. So, test of carbohydtrates should be different from that of other three.

Question142

The two functional groups present in a typical carbohydrate are: [2009]

Options:

A. $-CHO$ and $-COOH$

B. $>C=O$ and $-OH$

C. $-OH$ and $-CHO$

D. $-OH$ and $-COOH$

Answer: C

Solution:

Note: Glucose is considered as a typical carbohydrate which contains - CHO and -OH groups.

Question143

α − D − (+) -glucose and β − D − (+) -glucose are [2008]

Options:

A. conformers

B. epimers

C. anomers

D. enatiomers

Answer: C

Question144

The secondary structure of a protein refers to [2007]

Options:

A. fixed configuration of the polypeptide backbone

B. α - helical backbone

C. hydrophobic interactions

D. sequence of α -amino acids.

Answer: B

Solution:

Solution:
The secondary structure of a protein refers to the shape in which a long peptide chain can exist. There are two different conformations of the peptide linkage present in protein, these are α -helix and β -conformation. The α helix always has a right handed arrangement. In β− conformation all peptide chains are streched out to nearly maximum extension and then laid side by side and held together by intermolecular hydrogen bonds. The structure resembles the pleated folds of draping and therefore is known as β -pleated sheet.

Question145

The term anomers of glucose refers to [2006]

Options:

A. enantiomers of glucose

B. isomers of glucose that differ in configuration at carbon one (C − 1)

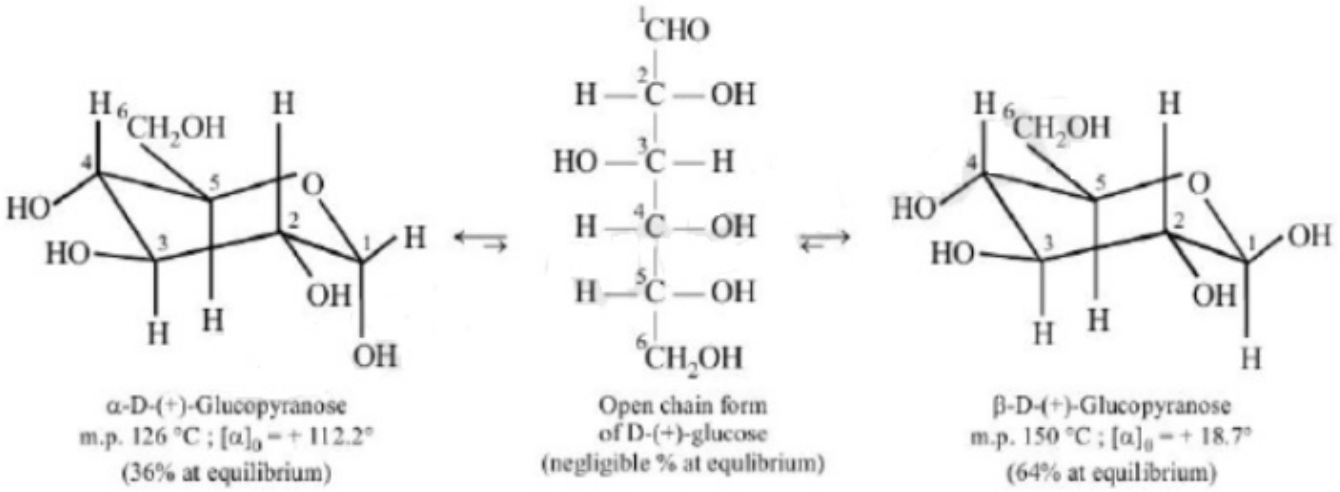
C. isomers of glucose that differ in configurations at carbons one and four (C − 1 and C − 4)

D. a mixture of (D)-glucose and (L)-glucose

Answer: B

Solution:

Cyclization of the open chain structure of D − (+) -glucose has created a new stereocenter at C_1 which explains the existence of two cyclic forms of D − (+) -glucose, namely α− and β − . These two cyclic forms are diasteromers, such diastereomers which differ only in the configuration of chiral carbon developed on hemiacetal formation (it is C_1 in glucose and C_2 in fructose) are called anomers and the hemiacetal carbon (C_1 or C_2) is called the anomeric carbon.



Question146

The pyrimidine bases present in DNA are [2006]

Options:

A. cytosine and thymine

B. cytosine and uracil

C. cytosine and adenine

D. cytosine and guanine

Answer: A

Solution:

The pyrimidine bases present in DNA are cytosine and thymine.

Question147

In both DNA and RNA, heterocyclic base and phosphate ester linkages are at
[2005]

Options:

A. C_5' and C_1' respectively of the sugar molecule

B. C_1' and C_5' respectively of the sugar molecule

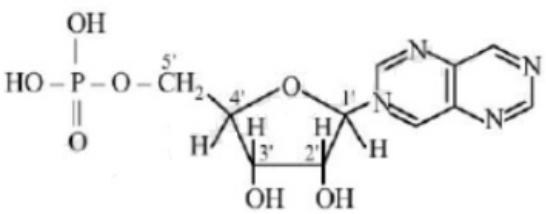
C. C_2' and C_5° respectively of the sugar molecule

D. C_5' and C_2' respectively of the sugar molecule

Answer: B

Solution:

Solution:
In DNA and RNA heterocyclic base and phosphate ester are at C_1' and C_5' respectively of the sugar molecule.



Question148

Which base is present in RNA but not in DNA?
[2004]

Options:

A. Guanine

B. Cytosine

C. Uracil

D. Thymine

Answer: C

Solution:

RNA contains cytosine and uracil as pyrimidine bases while DNA has cytosine and thymine. Both have the same purine bases i.e., guanine and adenine.

Question149

Insulin production and its action in human body are responsible for the level of diabetes. This compound belongs to which of the following categories?
[2004]

Options:

A. An enzyme

B. A hormone

C. A co-enzyme

D. An antibiotic

Answer: B

Solution:

Solution:
Insulin is a biochemically active peptide hormone secreted by pancreas.

Question150

Complete hydrolysis of cellulose gives
[2003]

Options:

A. D-ribose

B. D-glucose

C. L-glucose

D. D-fructose

Answer: B

Solution:

Solution:
Cellulose is a linear polymer of $\beta-D-$ glucose in which C_1 of one glucose unit is connected to C_4 of the other through $\beta-D$ glucosidic linkage. It does not undergo hydrolysis easily. However on heating with dilute H_2SO_4 under pressure, it undergoes hydrolysis to give only D-glucose.

$$(C_6H_{10}O_5)_n + nH_2O \xrightarrow{H^+} \underset{D-Glucose}{nC_6H_{12}O_6}$$

Question151

The reason for double helical structure of DNA is operation of [2003]

Options:

A. dipole-dipole interaction

B. hydrogen bonding

C. electrostatic attractions

D. van der Waals' forces

Answer: B

Solution:

Solution:
DNA consists of two polynucleotide chains, each chain forms a right handed spiral with ten bases in one turn of the spiral. The two chains coil to double helix and run in opposite direction held together by hydrogen bonding.

Question152

RNA is different from DNA because RNA contains [2002]

Options:

A. ribose sugar and thymine

B. ribose sugar and uracil

C. deoxyribose sugar and thymine

D. deoxyribose sugar and uracil.

Answer: B

Solution:

In RNA, the sugar is D-ribose and base is uracil, whereas in DNA, the sugar is D-2 deoxyribose and the nitrogenous base is thymine.
