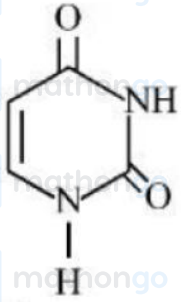
Q1 - 24 January - Shift 1

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



Given :

Molar mass N = 14 g mol^{-1}; O = 16 g mol^{-1}; C = 12 g mol^{-1}; H = 1 g mol^{-1};

Space for your notes:

Q2 - 24 January - Shift 2

Total number of tripeptides possible by mixing of valine and proline is _____

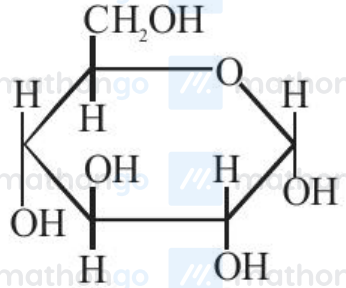
Space for your notes:

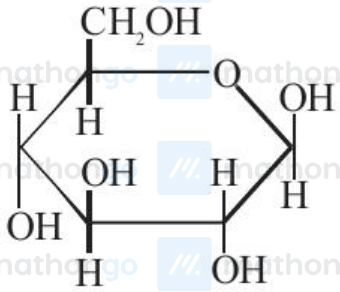
Q3 - 25 January - Shift 1

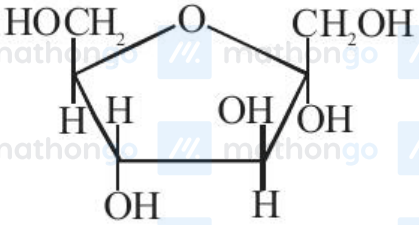
Match items of Row I with those of Row II.

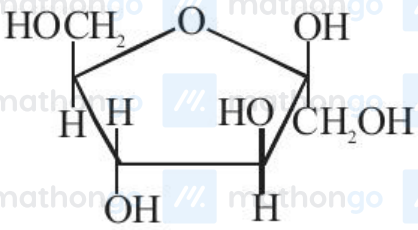
Space for your notes:

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

(1) P→iv, Q→iii, R→i, S→ii

(2) P→i, Q→ii, R→iii, S→iv

(3) P→iii, Q→iv, R→ii, S→i

(4) P→iii, Q→iv, R→i, S→ii

Q4 - 29 January - Shift 1

Number of cyclic tripeptides formed with 2 amino acids A and B is:

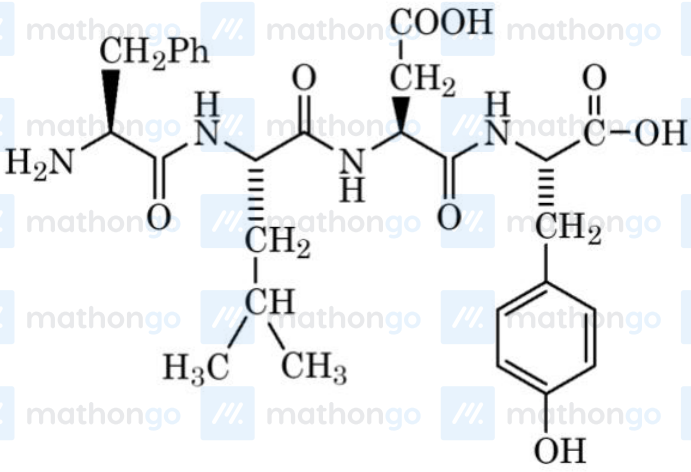
(1) 2 (2) 3

(3) 5 (4) 4

Space for your notes:

Q5 - 29 January - Shift 2

Following tetrapeptide can be represented as



(F, L, D, Y, I, Q, P are one letter codes for amino acids)

(1) FIQY (2) FLDY

(3) YQLF (4) PLDY

Space for your notes:

Q6 - 30 January - Shift 1

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 :

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

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

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

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

Space for your notes:

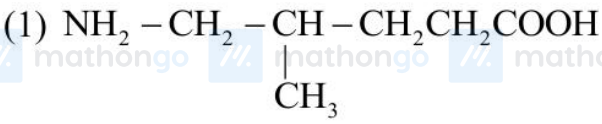
Q7 - 30 January - Shift 2

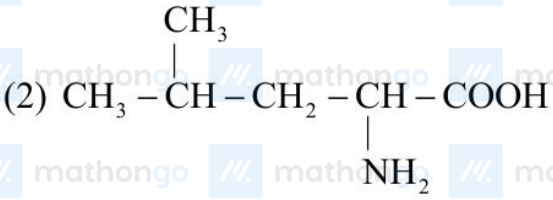
A short peptide on complete hydrolysis produces 3 moles of glycine (G), two moles of leucine (L) and two moles of valine (V) per mole of peptide. The number of peptide linkages in it are _____ .

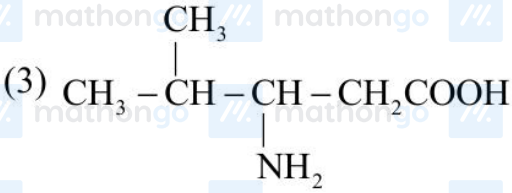
Space for your notes:

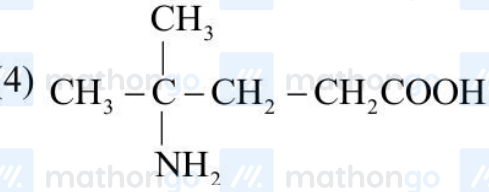
Q8 - 31 January - Shift 1

A protein 'X' with molecular weight of 70,000 u, on hydrolysis gives amino acids. One of these amino acid is

(1) 

(2) 

(3) 

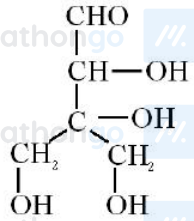
(4) 

Space for your notes:

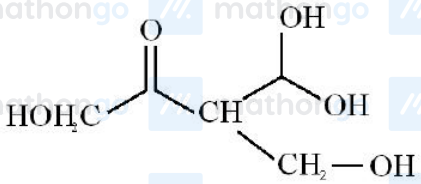
Q9 - 31 January - Shift 2

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 :

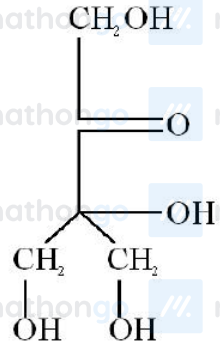
(1)



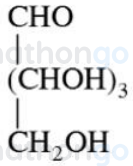
(2)



(3)



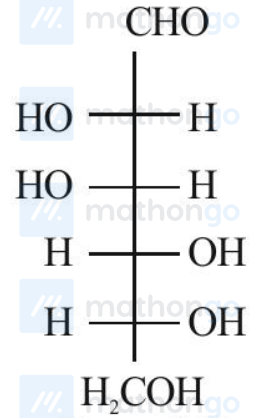
(4)



Space for your notes:

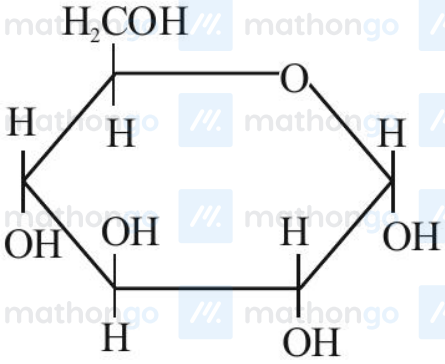
Q10 - 01 February - Shift 1

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

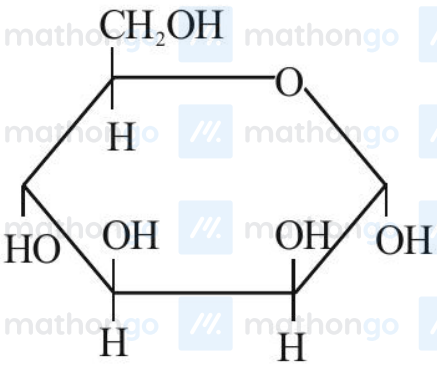


Sugar [X]

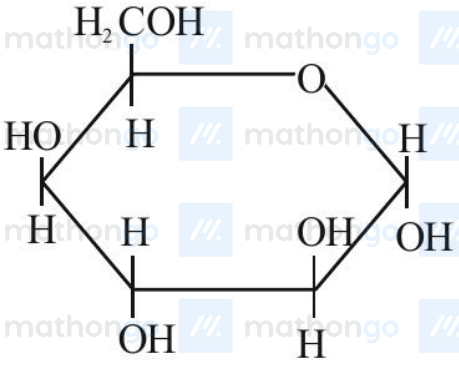
(1)

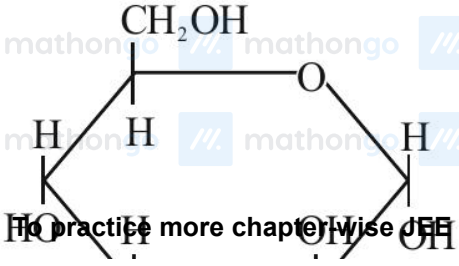


(2)



(3)





Space for your notes:

(4) 

Q11 - 01 February - Shift 1

Match List I and List II

List I	List II
Test	**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) (A) – I, (B) – II, (C) – III, (D) – IV

(2) (A) – III, (B) – IV, (C) –I, (D) – II

(3) (A) – II, (B) – I, (C) – III, (D) – IV

(4) (A) – III, (B) – IV, (C) –II, (D) – I

Space for your notes:

Q12 - 01 February - Shift 2

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

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

(3) **(A)** is correct but **(R)** is not correct.

(4) **(A)** is not correct but **(R)** is correct.

Space for your notes:

Answer Key

(As per Official NTA Key released on 2 Feb)

Q1 (25)	**Q2** (8)	**Q3** (4)	**Q4** (4)
Q5 (2)	**Q6** (3)	**Q7** (6)	**Q8** (2)
Q9 (1)	**Q10** (2)	**Q11** (3)	**Q12** (1)

Q1 (25)

$$\text{Mol. Wt of } C_4N_2H_4O_2 = 112$$

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

Q2 (8)

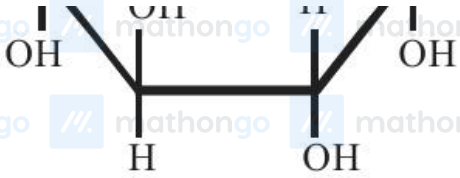
No. of possible tripeptide :

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

Q3 (4)

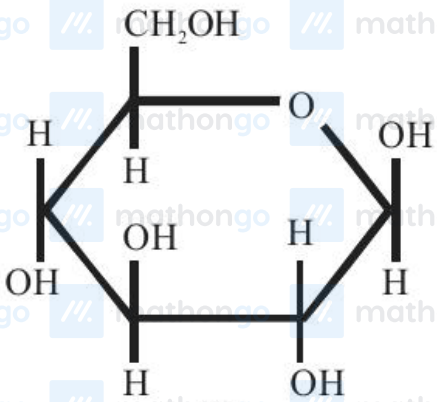
Structure



[A]

Represents α-D-(+) Glucopyranose

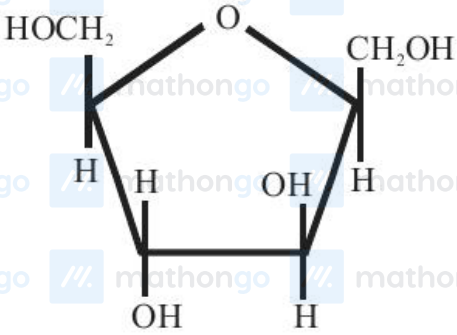
Structure



[B]

Represents β-D-(+) Glucopyranose

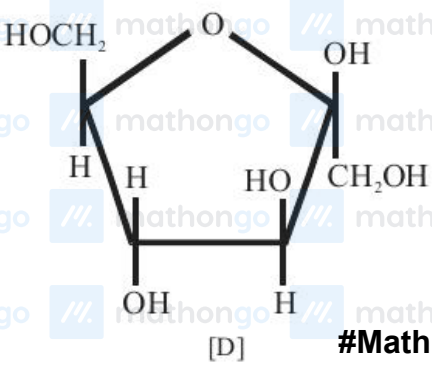
Structure



[C]

Represents β-D-(–) Fructofuranose

Structure

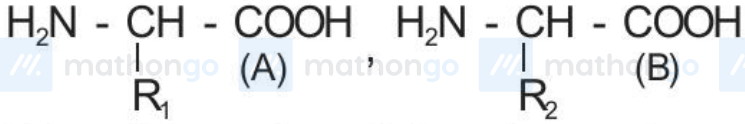


[D]

Represents β-D-(–) Fructofuranose
(from the given options best answer is D)

Q4 (4)

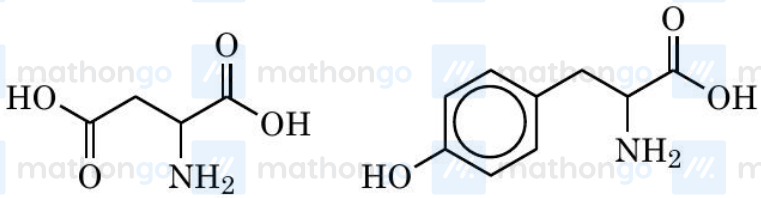
Two amino acid are



Tripeptide are formed from three amino acids

Q5 (2)

Hydrolysis of the given tetrapeptide will give the following:



Q6 (3)

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.

Q7 (6)

Number of peptide linkage = (amino acid – 1)
= 7 – 1 = 6

Q8 (2)

Only in option (2) α-Amino acid is given all the

Q9 (1)

(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.

Q10 (2)

By Haworth structure of mannose

Q11 (3)

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

Q12 (1)

Fact based