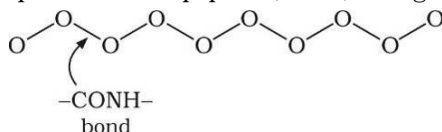


Daily Tutorial Sheet 2

JEE Advanced (Archive)

16.(B) Here, the  $-OH$  of hemiacetal group is equatorial therefore, it is a  $\beta$ -pyranose of an aldohexose.

17.(6) A decapeptide has nine peptide (amide) linkage as



Therefore, on hydrolysis, it will absorb nine water molecules.

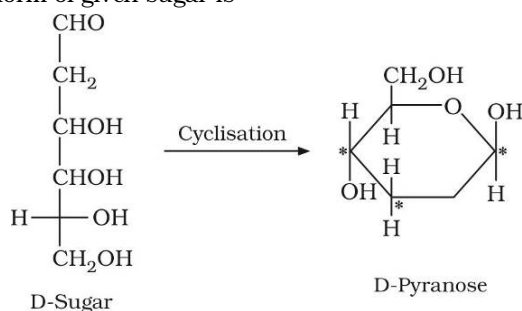
Hence, total mass of hydrolysis product =  $796 + 18 \times 9 = 958$

$$\Rightarrow \text{mass of glycine in hydrolysis product} = \frac{958 \times 47}{100} = 450$$

$$\Rightarrow \text{number of glycine molecule in one molecule of decapeptide} = \frac{450}{75} = 6$$

(Mol wt of glycine =  $75 \text{ gmol}^{-1}$ )

18.(8) The D-form of given sugar is



Total number of chiral centers = 3

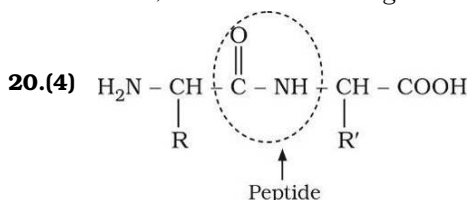
Total stereoisomers =  $2^3 = 8$

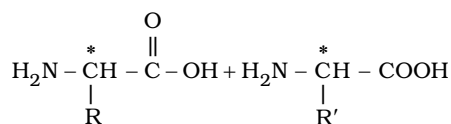
19.(4) The amino acid remain completely in Zwitter ionic form at its isoelectric point. Amino acids with additional acidic group have their isoelectric pH less than 7.0 and increasing pH above isoelectric point makes them anionic.

On the other hand, amino acids with additional basic group have their isoelectric pH greater than 7.0 and decreasing pH below isoelectric point (by adding acid solution) makes them cationic. The given peptide with following  $R_1$  and  $R_2$  are basic, will remain protonated (cationic) at  $pH = 7.0$ .

Peptide	$R_1$	$R_2$
IV	$CH_2CONH_2$	$(CH_2)_4NH_4$
VI	$(CH_2)_4NH_2$	$(CH_2)_4NH_4$
VIII	$CH_2OH$	$(CH_2)_4NH_4$
IX	$(CH_2)_4NH_2$	$CH_3$

Thus, 4 is the correct integer.





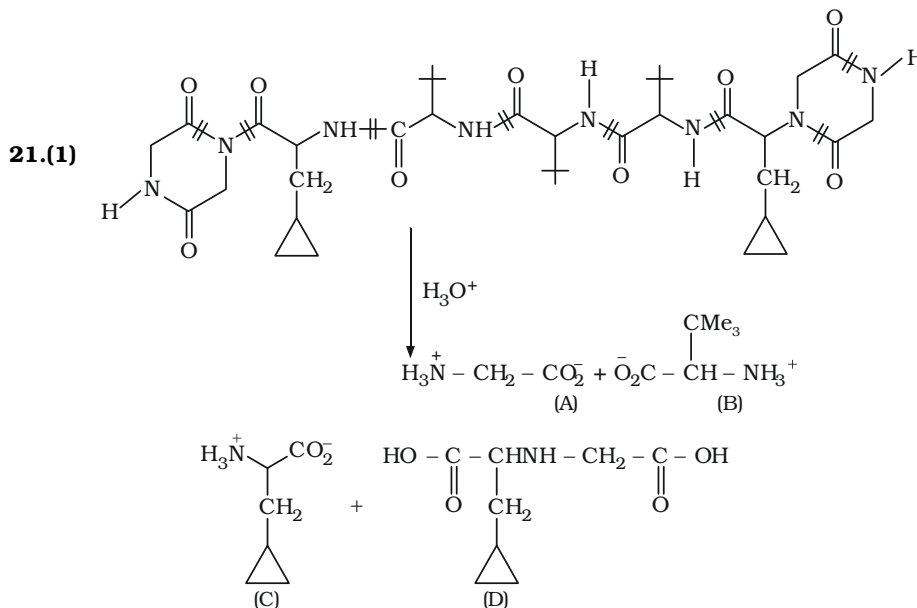
C\* is chiral carbon tetrapeptide has four amino acids joined by three peptide linkage.

-COOH group is on alanine part, thus it is at fixed C-terminal position in each combination.

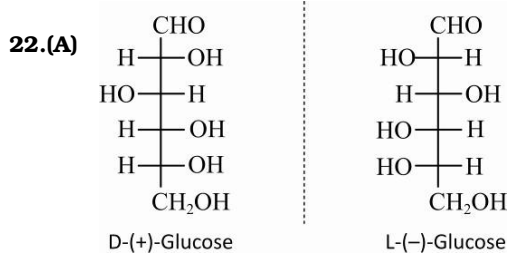
Glycine is optically inactive thus it cannot be on the N-terminal side. Thus, possible combinations are

Phe - Gly - Val - Ala, Phe - Val - Gly - Ala, Val - Gly - Phe - Ala, Val - Phe - Gly - Ala

Thus, in all four combinations are possible.



(A) is glycine which is only naturally occurring amino acid. While (B), (C) and (D) are not the naturally occurring amino acids.



**23.(D)** 
$$\text{pI} = \frac{\text{pK}_{a_1} + \text{pK}_{a_2}}{2} = \frac{1.88 + 3.65}{2} = 2.765$$

