CHAPTER - 23
BIOMOLECULES

1. 2 Aldotriose is the first member of aldose series

2. 4 $\alpha-$ and $\beta-$ forms are anomers. They differ only in the configuration at anomeric carbon

3. 1 Starch and cellulose are polymers of α and β-glucose, respectively. Lactose contains galactose and glucose; Maltose contains two α-glucose units; sucrose is a disaccharide of α-glucose and β-fructose

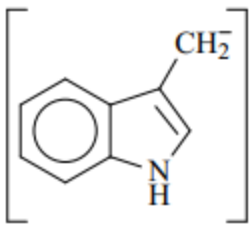
4. 1 All monosaccharides are reducing sugars. Sucrose is non-reducing

5. 3 Aldoses can react with Br_2 water whereas ketoses cannot react with Br_2 water. Both aldoses and ketoses can react with Tollen's and Fehling's reagent

6. 2 Glucose pentaacetate contains no free aldehyde group

7. 1 (1) and (2) represent $\alpha-$ and $\beta-$ glucose, respectively

8. 4 Glycogen and amylopectin are branched chain polymers of $\alpha-D-glucose$

9. 3 Tryptophan contains aromatic side chain 

10. 4

Amino acid	**Side chain**
Serine	$-CH_2OH$
Cysteine	$-CH_2SH$
Methionine	$-CH_2CH_2SCH_3$

11. 3 Insulin, albumin and haemoglobin are globular proteins

12. 3 Tripeptide contains three amino acids

13. 1 Amino acid (1) is an α-amino acid and it is classified as neutral as it contains equal number of $-NH_2$ and –COOH groups

14. 2 Enzymes are proteins with catalytic ability that are highly specific for a particular reaction/substrate

15. 1 Denaturation doesnot affect 1° structure of proteins

16 4 Vitamins A, E and K are fat soluble: Vitamin B is water soluble

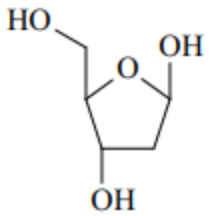
17. 3 Pyridoxine is vit. B_6

18. 1 Vit.A deficiency leads to xerophthalmia; vit. E deficiency leads to increased fragility of RBCs

19. 1 Both DNA and RNA are polynucleotides. Ribose and 2-deoxyribose are pentose sugars.

20. 2 RNA contains adenine, guanine, uracil and cytosine

21. 3 Structure of 2-deoxyribose sugar is



22. 9 Glucose unit contains five whereas fructose unit contains four asymmetric carbon atoms

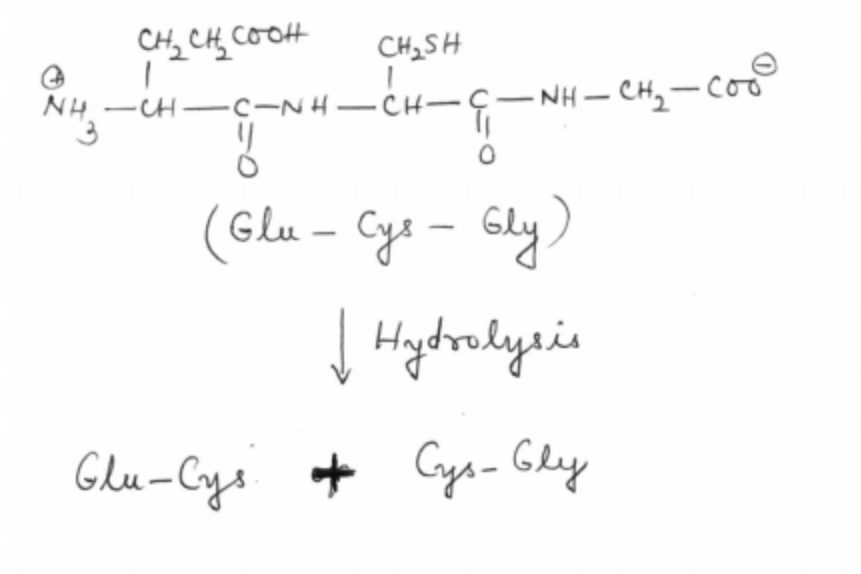
23. 4 Valine, leucine, threonine and isoleucine are essential amino acids

24. 6 Number of carbonyl groups in A = 0, G = 1, T = 2, C = 1 and U = 2

25. 6 All are hormones

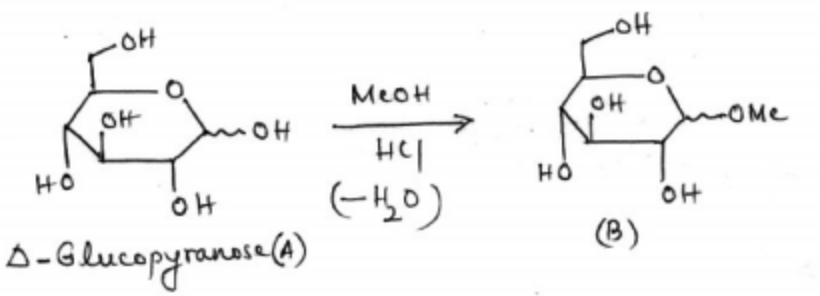
26. B Proline doesnot contain a 1° amino group.

27. A

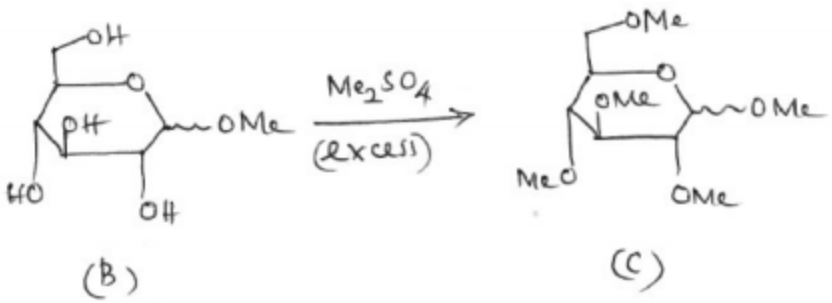


28. A Cyclic structure of glucose does not contain acetal linkage.

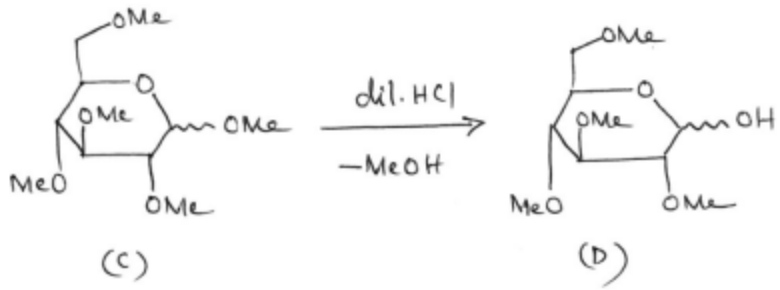
29. C



30. C



31. D

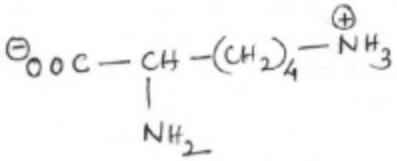


(C) (D)

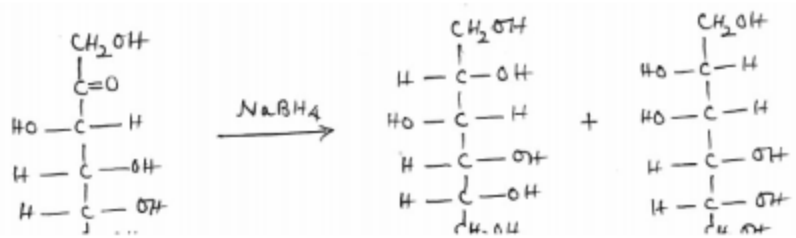
32. A

Amino acid	Structure at pH 7
Asp	$^{\ominus}OOC-CH_2-CH(^{\oplus}NH_3)-COO^{\ominus}$

33. A



34. AD



35. BC

In X, reducing group of both monosaccharides are involved in glycosidic bond formation, thus X is non-reducing.

In Y, reducing group of second monosaccharide is not involved in glycosidic bond formation, thus Y is a reducing sugar.

36. ABCD

Sugar + Nitrogen base ⟶ Nucleoside
(at 1' of sugar)

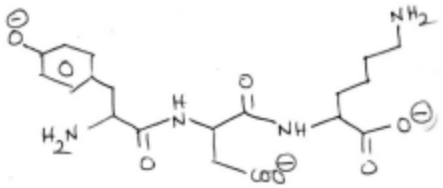
Nucleoside + Phosphoric acid ⟶ Nucleotide
(at 5' of sugar)

Phosphodiester linkage is formed between 3' and 5' positions of two nucleotides.

Complete hydrolysis of both RNA and DNA yield aldopentose sugar, phosphoric acid and nitrogen bases.

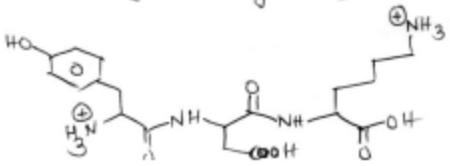
37. 5

Structure at pH 11 is,



(Net charge = −3)

Structure at pH 2 is,



38. 4 Saccharic acid contains four asymmetric carbon atoms.

39. **6** Total weight of products of complete hydrolysis = $796 + (9 \times 18)$

$= 958$ g (from 1 mol decapeptide)

Total mass of glycine $= 958 \times \frac{47}{100} = 450.26$ g

No. of glycine units per decapeptide $= \frac{450.26}{75} = 6$

40. **A**