Chapter_14

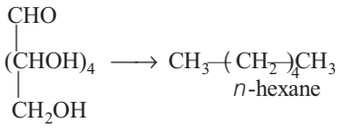
Biomolecules

Practice Questions

1. Carbohydrate that cannot be hydrolysed further to give simpler unit of polyhydroxy aldehyde or ketone is called
(a) monosaccharide *(b)* oligosaccharide
(c) polysaccharide *(d)* sucrose

2. Which of the following is not an example of polysaccharide?
(a) Starch *(b)* Cellulose
(c) Glycogen *(d)* Maltose

3. Name the reagent and condition required for carrying out the following reaction.



(a) HF, Δ *(b)* HCl, Δ
(c) HBr, Δ *(d)* HI, Δ

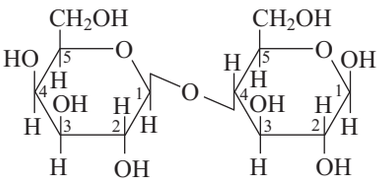
4. Name the product which is formed by the oxidation of glucose and gluconic acid with nitric acid.
(a) Rhamnose
(b) Saccharic acid
(c) Citric acid
(d) Oxalic acid

5. Which of the following act as epimeric pair?
(a) Glucose and fructose
(b) Fructose and mannose
(c) Glucose and mannose
(d) Glucose and sucrose

6. In sucrose, the two monosaccharides are held together by a glycosidic linkage. The linkage is between
(a) C_1 of α-D-glucose and C_2 of β-D-fructose
(b) C_2 of α-D-glucose and C_1 of β-D-fructose
(c) C_1 of β-D-glucose and C_2 of β-D-fructose
(d) C_1 of β-D-glucose and C_2 of α-D-fructose

7. Invert sugar is a mixture of
(a) D-glucose + D-fructose
(b) L-glucose + D-fructose
(c) L-glucose + D-glucose
(d) L-glucose + L-glucose

8.



Study the structure carefully and then mark the correct option of followed question.

What is the name of above disaccharide?
(a) Sucrose *(b)* Maltose
(c) Lactose *(d)* Talose

9. Which of the following is known as animal starch?
(a) Amylose *(b)* Amylopectin
(c) Glycogen *(d)* Cellulose

10. The total number of amino acids to form protein in human body is
(a) 25 *(b)* 100
(c) 20 *(d)* 10

11. Which of the following amino acids can be synthesised in the body?
(a) Valine *(b)* Leucine
(c) Lysine *(d)* Glycine

12. Which of the following structure of protein is formed when polypeptide in a protein has amino acids linked with each other in a specific sequence?
(a) primary structure
(b) secondary structure
(c) tertiary structure
(d) quaternary structure

13. The spatial arrangement of the two or more polypeptide chains with respect to each other is known as
(a) primary structure
(b) secondary structure
(c) tertiary structure
(d) quaternary structure

14. Which of the following is/are example(s) of denaturation of protein?
(a) Coagulation of egg white
(b) Clotting of blood
(c) Curdling of milk
(d) Both (a) and (c)

15. What is the common name given to the enzyme which catalyse the oxidation of one substrate with simultaneous reduction of another substrate?
(a) Reductioxidase
(b) Oxidonductase
(c) Oxidoreductase
(d) Reductoxides

16. Which of the following is a fat soluble vitamin?
(a) Vitamin A *(b)* Vitamin B_6
(c) Vitamin C *(d)* Vitamin B_2

17. Water soluble vitamin is
(a) vitamin C *(b)* vitamin D
(c) vitamin E *(d)* vitamin K

18. Pyridoxine is also known as
(a) vitamin B_2 *(b)* vitamin B_6
(c) vitamin B_{12} *(d)* vitamin B_1

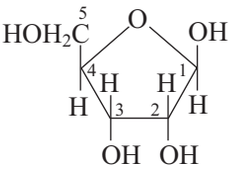
19. Which of the following disease is caused by the deficiency of vitamin E?

(a) *Beri-beri* *(b)* Rickets
(c) Scurvy *(d)* Muscular weakness

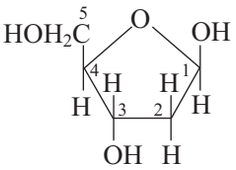
20. Which of the following combination is correct between nucleic acid and its respective sugar base?

(a) DNA → β-D-3-deoxyribose
(b) DNA → β-D-1-deoxyribose
(c) RNA → β-D-ribose
(d) RNA → β-D-3-deoxyribose

21. Consider the following structures.



β-D-ribose
I



β-D-2-deoxyribose
II

Identify structure I and II and choose the correct option.

	I	II
(a)	β-D-ribose	β-D-2-deoxyribose
(b)	α-D-ribose	β-D-3-deoxyribose
(c)	β-D-deoxyribose	β-D-ribose
(d)	β-D-deoxyribose	α-D-ribose

22. Which one of the following does not constitute the nucleic acid?

(a) Uracil
(b) Ribose sugar
(c) Phosphoric acid
(d) Guanidine

23. Which of the following is a type of RNA?

(a) *m*-RNA *(b)* *t*-RNA
(c) *r*-RNA *(d)* All of these

24. Which of the following is not a hormone?

(a) Insulin
(b) Endorphins
(c) Norepinephrine
(d) Thymine

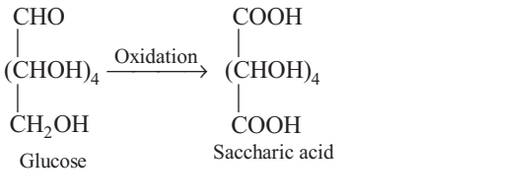
25. The major role of insulin is

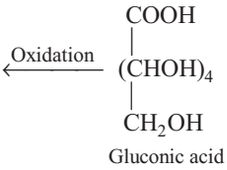
(a) to decrease the glucose level in human body
(b) to keep the blood glucose level within the narrow limit
(c) to regulate growth
(d) to transport minerals

ANSWERS

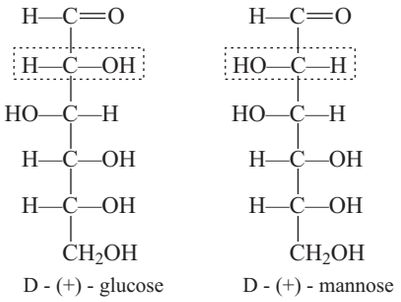
1.	(a)	**2.**	(d)	**3.**	(d)	**4.**	(b)	**5.**	(c)	**6.**	(a)	**7.**	(a)	**8.**	(c)	**9.**	(c)	**10.**	(c)
11.	(d)	**12.**	(a)	**13.**	(d)	**14.**	(d)	**15.**	(c)	**16.**	(a)	**17.**	(a)	**18.**	(b)	**19.**	(d)	**20.**	(c)
21.	(a)	**22.**	(d)	**23.**	(d)	**24.**	(d)	**25.**	(b)										

4. (*b*) Glucose and gluconic acid, both on oxidation yields a dicarboxylic acid, saccharic acid. This indicates the presence of primary alcohol (OH) group in glucose. Reaction involved is as follows :



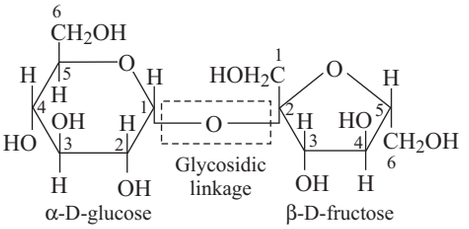


5. (*c*) Glucose and mannose are epimers because they differ in configuration at only one chiral carbon.



6. (*a*) In sucrose, the two monosaccharides are held together by a glycosidic linkage.

The linkage is between C_1 of α-D-glucose and C_2 of β-D-fructose.



Sucrose

7. (*a*) Invert sugar is a mixture of D-glucose and D-fructose. Sucrose is also known as invert sugar. Solution of sucrose is dextrorotatory. When sucrose is hydrolysed it forms equimolar quantity of D-glucose and D-fructose. The solution of formed products is found to be laevorotatory. This change in optical properties of sucrose is called inversion of cane sugar. The equimolar product is formed, i.e. D-glucose and D-fructose is called invert sugar.

8. (*c*) The given disaccharide is lactose. In this structure, the linkage is between C1 of galactose and C4 of glucose.

9. (*c*) Glycogen is also known as animal starch because its structure is similar to amylopectin and is rather more highly branched. The carbohydrates get stored in animal body as glycogen.

10. (*c*) The total number of amino acids to form protein in human body is 20. These amino acids are necessary to build protein in body.

11. (*d*) Valine, leucine and lysine are among the amino acids that cannot be synthesised in body, whereas glycine can be synthesised in the body.

12. (*a*) In primary structure of protein, each polypeptide in a protein has amino acids linked with each other in a specific sequence.

14. (*d*) Coagulation of egg white and curdling of milk are examples of denaturation of protein.
During denaturation, secondary and tertiary structures are destroyed but primary structure remain intact. Clotting of blood is not a kind of denaturation of protein.

15. (*c*) Enzyme which catalyse the oxidation of one substrate with simultaneous reduction of another substrate are named as oxidoreductase enzyme.
The ending of the name of an enzyme is -ase.

16. (*a*) Vitamin A is a fat soluble vitamin because it is soluble in fat and oils but insoluble in water.

17. (*a*) Vitamin C is water soluble, while vitamin A,D,E and K are fat soluble.

19. (*d*) Muscular weakness is caused by the deficiency of vitamin E. To remove deficiency, vegetable oil like wheat germ oil, sunflower oil etc. should be included in the diet.

20. (*c*) Option (c) is the correct combination. In DNA molecule, the sugar moiety is β-D-2-deoxyribose whereas in RNA molecule, it is β-D-ribose.

22. (*d*) Guanidine does not constitute the nucleic acid. Uracil is a base present in RNA. Ribose sugar and phosphoric acid are a part of DNA or RNA.

23. (*d*) RNA molecules are of three types and they perform different functions. They are named as messenger RNA(*m*-RNA), ribosomal RNA (*r*-RNA) and transfer RNA (*t*-RNA).

24. (*d*) Thymine is not a hormone. It is a nitrogenous base. All other three options are hormone. Insulin and endorphins are polypeptides, whereas norepinephrine is an amino acid derivatives.