

## Biomolecules

## 1. Carbohydrates

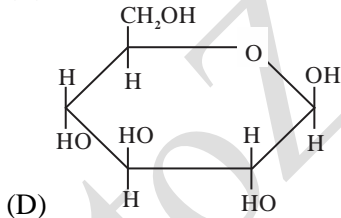
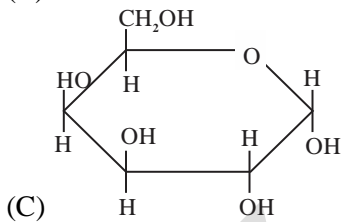
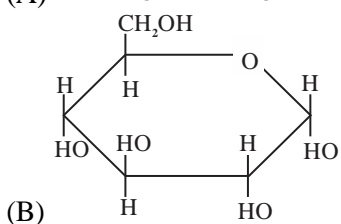
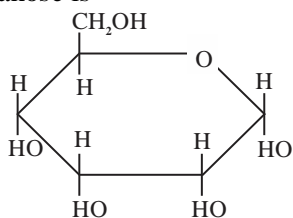
- Q 1. General formula of carbohydrates are  
 (A)  $C_x(H_2O)_y$  (B)  $C_x(H_2O)_x$   
 (C)  $C_y(H_2O)_y$  (D)  $C_{2x}(H_2O)_y$
- Q 2. Which of the following is not a carbohydrate?  
 (A)  $\begin{array}{c} CH_2O \\ | \\ CH_2O \end{array}$  (B)  $\begin{array}{c} OH \\ / \\ CH_2 \\ \backslash \\ OH \end{array}$   
 (C)  $\begin{array}{c} CHO \\ | \\ CH_2OH \\ | \\ CH_2 \\ | \\ CH_2OH \end{array}$  (D) All of these
- Q 3. The smallest Aldose is  
 (A) Glyceraldehyde (B) Glucose  
 (C) Maltose (D) Lactose
- Q 4. The smallest Ketose contain  
 (A) 3 carbon (B) 4 Carbon  
 (C) 5 Carbon (D) 6 Carbon
- Q 5. Which of the following is a monosaccharide ?  
 (A) Sucrose (B) Galactose  
 (C) Maltose (D) Lactose
- Q 6. Sucrose on hydrolysis gives  
 (A) glucose only  
 (B) glucose and galactose  
 (C) glucose and fructose  
 (D) glucose and lactose
- Q 7. The disaccharide present in milk is  
 (A) sucrose (B) lactose  
 (C) maltose (D) none of these
- Q 8. Oligosaccharides contains  
 (A) 3-5 Carbon atoms  
 (B) 3-10 Carbon atom  
 (C) 5-20 Carbon atom  
 (D) 3 Carbon atom
- Q 9. Which of the saccharides is crystalline structure?  
 (A) Monosaccharides  
 (B) Disaccharides  
 (C) Oligosaccharides  
 (D) Polysaccharides
- Q 10. D-Glyceraldehyde has asymmetric carbon with  
 (A) R-Configuration  
 (B) S-Configuration  
 (C) Can be R or S-Configuration  
 (D) R/S – Configuration is not applicable here
- Q 11. Any D-isomer has asymmetric carbon with  
 (A) R-Configuration  
 (B) S-Configuration  
 (C) Can be R or S-Configuration  
 (D) R/S – Configuration is not applicable here
- Q 12. A D-isomer of a compound is  
 (A) dextrorotatory (B) Levorotatory  
 (C) Either a or b (D) None of these
- Q 13. D-Glyceraldehyde & L-Glyceraldehyde are  
 (A) Diastereomers (B) Enantiomer  
 (C) Identical (D) Tautomer
- Q 14. D/L Configuration is applied on  
 (A) First asymmetric carbon  
 (B) Last asymmetric carbon  
 (C) 3<sup>rd</sup> Asymmetric carbon  
 (D) 2<sup>nd</sup> asymmetric carbon
- Q 15. D-Glucose & D-mannose are  
 (A) Diastereomers (B) Epimer  
 (C) Anomer (D) Both A & B
- Q 16. D- Glucose & D- Gulcose are  
 (A) Diastereomers (B) Epimer  
 (C) Anomer (D) None of these
- Q 17. Which of the following monosaccharides is a pentose ?  
 (A) Glucose (B) Fructose  
 (C) Arabinose (D) Galactose

## 2. Glucose &amp; Fructose

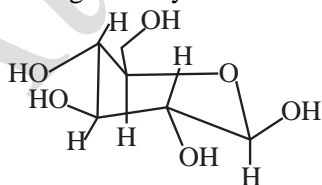
- Q 1. Glucose and fructose are  
 (A) optical isomers  
 (B) functional group isomers  
 (C) chain isomers  
 (D) position isomers
- Q 2. The number of chiral carbon atoms in  $\beta$ -D(+)-glucose molecule is  
 (A) 3 (B) 5  
 (C) 4 (D) 6
- Q 3.  $\alpha$ -D- Glucose &  $\beta$ -D- Glucose are  
 (A) Diastereomers

- (B) emiper  
(C) Anomer  
(D) Enoutiomer
- Q 4. The term anomers of glucose refers to  
(A) isomers of glucose that differs in configuration at carbons one and four (C-1 and C-4)  
(B) a mixture of (D-) glucose and (L-) glucose  
(C) enantiomers of glucose  
(D) isomers of glucose that differ in configuration at carbon

Q 5. The correct representation of  $\alpha$ -D-Glucopyranose is



Q 6. The following carbohydrate is



- (A) a ketohexose (B) an aldohexose  
(C) an  $\alpha$ -furanose (D) an  $\alpha$ -pyranose
- Q 7. Glucose cannot be classified as

- (A) a hexose (B) an oligosaccharide  
(C) a carbohydrate (D) an aldose

Q 8. Glucose when reduced with HI and red phosphorus gives

- (A) n-hexane (B) n-heptane  
(C) n-pentane (D) n-octane

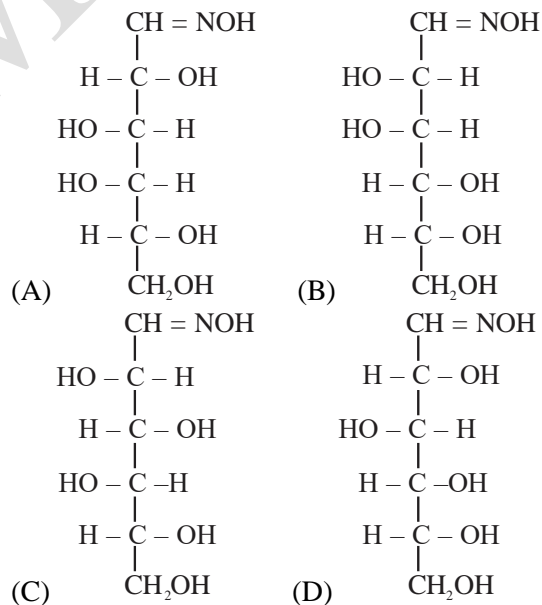
Q 9. Glucose does not react with

- (A) HCN (B)  $\text{H}_2\text{NOH}$   
(C)  $\text{C}_6\text{H}_5\text{NHNH}_2$  (D)  $\text{NaHSO}_3$

Q 10.  $\alpha$ -D-glucose and  $\beta$ -D-glucose differ from each other due to the difference in one of the carbons with respect to its :

- (A) configuration  
(B) number of -OH groups  
(C) conformation  
(D) size of hemiacetal ring

Q 11. D+ glucose reacts with hydroxylamine and yields an oxime. The structure of the oxime would be



Q 12. The mole of  $\text{HIO}_4$  required to oxidize one mole of D-Glucose is

- (A) 2 (B) 4  
(C) 5 (D) 6

Q 13. The mole of  $\text{AC}_2\text{O}$  required to react per mole of D-Glucose is

- (A) 2 (B) 4  
(C) 6 (D) 5

Q 14. The number of carbon atom in Glucose can be increased by using reagents

- (A)  $\text{NaCN}, \text{H}_2\text{IPd}, \text{H}_3\text{O}^+$   
 (B)  $\text{NaCN}, \text{H}_3\text{O}^+$   
 (C)  $\text{Br}_2 / \text{H}_2\text{O}, \text{Ca}(\text{OH})_2$   
 (D)  $\text{NH}_2\text{OH}, \text{H}_3\text{O}^+$

Q 15. On prolong heating with HI, Glucose converts into

- (A)  $\begin{array}{cccccc} \text{CH}_2 & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH}_2 \\ | & & | & & | & & | & & | & & | & & | \\ \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} \end{array}$   
 (B)  $\text{CH}_3(\text{CH}_2)_4\text{CH}_3$   
 (C)  $\begin{array}{cccccc} \text{CH}_2 & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH} & - & \text{CH}_2 \\ | & & | & & | & & | & & | & & | & & | \\ \text{I} & & \text{I} & & \text{I} & & \text{I} & & \text{I} & & \text{I} & & \text{I} \end{array}$   
 (D) None of these

Q 16. When glucose is reacted with bromine water, the major product is

- (A) gluconic acid (B) saccharic acid  
 (C) tartronic acid (D) meso oxalic acid

### 3. Fructose, Sucrose

Q 1. The cyclic structure of fructose is

- (A) hemiacetal form (B) hemiketal form  
 (C) Acetal form (D) Ketal form

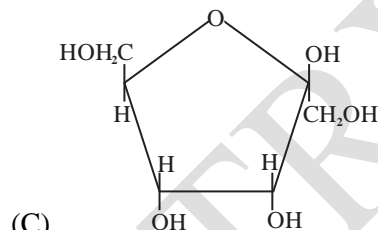
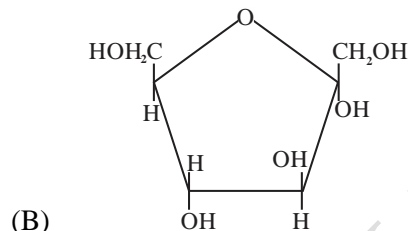
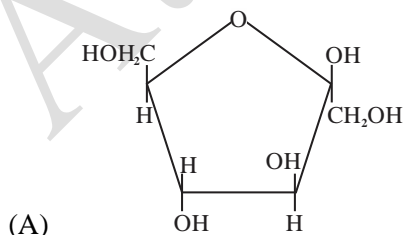
Q 2. The cyclic structure of fructose is

- (A) hemiacetal form (B) hemiketal form  
 (C) Acetal form (D) Ketal form

Q 3.  $\alpha$ -D-fructose &  $\beta$ -D-fructose are

- (A) Epimer (B) Enantiomer  
 (C) Anomer (D) Identical

Q 4. The correct structure of  $\alpha$ -D-fructofuranose is



(D) None of these

Q 5. The oxidation of D-fructose with  $\text{HIO}_4 / \text{Pb}(\text{OAc})_2$  gives

- (A)  $2\text{HCHO} + 4\text{HCOOH}$   
 (B)  $\text{CO}_2 + 4\text{HCOOH}$   
 (C)  $2\text{HCHO} + \text{CO}_2 + 3\text{HCOOH}$   
 (D)  $2\text{CO}_2 + 4\text{HCHO}$

Q 6. The oxidation of 1 molecule of  $\alpha$ -D-fructose with  $\text{HNO}_3$  gives

- (A)  $\begin{array}{c} \text{COOH} \\ | \\ \text{C} = \text{O} \\ | \\ (\text{CHOH})_3 \\ | \\ \text{COOH} \end{array}$   
 (B)  $\text{HCHO} + \text{CO}_2 + 3\text{HCOOH}$

- (C) 3 molecules of  $\begin{array}{c} \text{COOH} \\ | \\ \text{COOH} \end{array}$   
 (D) None of these

Q 7. Which one of the following sets of monosaccharides form sucrose ?

- (A)  $\alpha$ -D-galactopyranose and  $\alpha$ -D-glucopyranose  
 (B)  $\alpha$ -D-glucopyranose and  $\beta$ -D-fructofuranose  
 (C)  $\beta$ -D-glucopyranose and  $\alpha$ -D-fructofuranose  
 (D)  $\alpha$ -D-glucopyranose and  $\beta$ -D-fructopyranose

Q 8. Sucrose is made up of

- (A) D-glucose + L-fructose  
 (B) D-glucose + D-fructose  
 (C) D-fructose + L-glucose  
 (D) L-fructose + L-glucose
- Q 9. In sucrose, which glycosidic linkage is present?  
 (A) C<sub>1</sub>-C<sub>2</sub> linkage (B) C<sub>1</sub>-C<sub>4</sub> linkage  
 (C) C<sub>1</sub>-C<sub>3</sub> linkage (D) C<sub>2</sub>-C<sub>4</sub> linkage
- Q 10. When sucrose is dissolved in water, optical rotation changes from  
 (A) dextrorotatory to levorotatory  
 (B) Levorotatory to dextrorotatory  
 (C) Levorotatory to Levorotatory  
 (D) Dextrorotatory to Dextrorotatory
- Q 11. The optical rotation of sucrose, D-Glucose & D-fructose are +66.5°, +52.7° & -92.4° respectively. Find the change in optical rotation when sucrose dissolve in H<sub>2</sub>O is  
 (A) 46.65° (B) 26.8°  
 (C) 86.35° (D) None of these
- Q 12. Hydrolysis of sucrose is called  
 (A) saponification (B) hydration  
 (C) inversion (D) esterification
- Q 13. Which one is a disaccharide?  
 (A) Starch (B) Lactose  
 (C) Cellulose (D) Fructose
- Q 14. A disaccharide, which gives only glucose on hydrolysis, is  
 (A) lactose (B) fructose  
 (C) sucrose (D) maltose
- Q 15. α - maltose consists of  
 (A) one α - D-glucopyranose unit and one β - D - glucopyranose unit with 1,2-glycosidic linkage  
 (B) Two α - D-glucopyranose units with 1,2-glycosidic linkage  
 (C) two β - D - glucopyranose units with 1,4-glycosidic linkage  
 (D) two α - D - glucopyranose units with 1,4-glycosidic linkage
- Q 16. The linkage between the two monosaccharide units in lactose is  
 (A) C<sub>1</sub> of β - D - glucose and C<sub>4</sub> of β - D - galactos  
 (B) C<sub>1</sub> and β - D - galactose and C<sub>4</sub> of β - D - glucose  
 (C) C<sub>1</sub> of α - D - galactose and C<sub>4</sub> of β - D - glucose  
 (D) C<sub>1</sub> of β - D - galactose and C<sub>4</sub> of α - D - glucose  
 (E) C<sub>1</sub> of α - D - glucose and C<sub>4</sub> of α - D - galactose
- Q 17. Lactose is made of  
 (A) α - D - glucose only  
 (B) β - D - galactose and β - D - glucose  
 (C) α - D - glucose and α - D - glucose  
 (D) β - D - galactose and α - D - glucose
- Q 18. Lactose on hydrolysis gives  
 (A) glucose (B) fructose  
 (C) fructose + glucose (D) glucose + galactose

#### 4. Starch, Cellulose, Maltose

- Q 1. Starch has general formula of  
 (A) (C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>)<sub>n</sub> (B) (C<sub>5</sub>H<sub>10</sub>O<sub>6</sub>)<sub>n</sub>  
 (C) (C<sub>5</sub>H<sub>10</sub>O<sub>3</sub>)<sub>n</sub> (D) (C<sub>6</sub>H<sub>12</sub>O<sub>5</sub>)<sub>n</sub>
- Q 2. Starch is a polymer of  
 (A) fructose (B) glucose  
 (C) both (A) and (B) (D) none of these
- Q 3. Polysaccharides have ..... linkages  
 (A) glycosidic (B) anomeric  
 (C) epimeric (D) polymorphic
- Q 4. Starch is used to test even the small amount of  
 (A) urea in blood  
 (B) iodine in aqueous solution  
 (C) protein in blood  
 (D) glucose in aqueous solution
- Q 5. The glycosidic linkage involved in linking the glucose units in amylose part of starch is  
 (A) C<sub>1</sub>-C<sub>4</sub> β - linkage

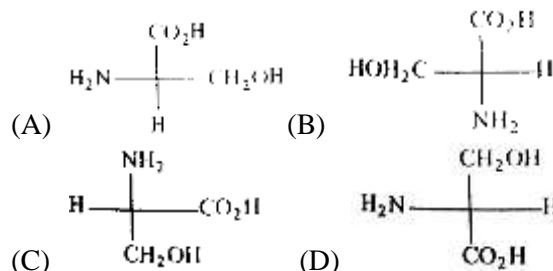
- (B)  $C_1 - C_4$   $\alpha$  - linkage  
 (C)  $C_1 - C_5$   $\alpha$  - linkage  
 (D)  $C_1 - C_6$   $\alpha$  - linkage
- Q 6. The aqueous solution of a carbohydrate gave dark blue colour with iodine solution. The carbohydrate is  
 (A) starch (B) sucrose  
 (C) fructose (D) glucose
- Q 7. A mixture of amylose and amylopectin is called  
 (A) lactose (B) starch  
 (C) cellulose (D) sucrose
- Q 8. In amylopectin, which Glucosidic linkage is present ?  
 (A)  $C_1 - C_4$  linkage (B)  $C_1 - C_6$  linkage  
 (C) both a & b (D) None of these
- Q 9. Which of the following is the most abundant carbohydrate found in plants?  
 (A) Cellulose (B) Starch  
 (C) Lipids (D) Fructose
- Q 10. Which of the following sugar is called Animal Starch?  
 (A) Amylopectin (B) Amylose  
 (C) Glycogen (D) Lactogene
- Q 11. Which part of starch is water soluble  
 (A) Amylose (B) Amylopectin  
 (C) Dextrin (D) None of these
- Q 12. In cellulose, D-Glucose are attached together with  
 (A)  $\alpha - 1, 4 -$  Glucosidic linkage  
 (B)  $\beta - 1, 4 -$  Glucosidic linkage  
 (C)  $\alpha - 1, 6 -$  Glucosidic linkage  
 (D)  $\beta - 1, 6 -$  Glucosidic linkage
- Q 13. In maltose, which Glucosidic linkage is present  
 (A)  $\alpha C_1 - C_1$  linkage  
 (B)  $\beta C_1 - C_4$  linkage  
 (C)  $\alpha C_1 - C_6$  linkage  
 (D)  $\beta - C_1 - C_6$  linkage
- ### 5. Test of Carbohydrates
- Q 1. Which gives red colour with Fehling's solution ?  
 (A) Glucose (B) Cellulose  
 (C) Benzaldehyde (D) Cane-sugar
- Q 2. Which of the following carbohydrates is used in silvering of mirrors ?  
 (A) Sucrose (B) Cellulose  
 (C) Fructose (D) Glucose
- Q 3. The reagent which may be used to distinguish between cane - sugar and glucose solution is  
 (A) Molisch's reagent (B) Iodine solution  
 (C) Baeyer's reagent (D) Fehling's solution
- Q 4. Glucose is a/an  
 (A) oxidizing sugar (B) reducing sugar  
 (C) reducing and oxidizing sugar  
 (D) none of the above
- Q 5. Glucose reacts with excess of phenylhydrazine and forms :  
 (A) Sorbitol (B) glucose phenylhydrazone  
 (C) glucosazone (D) glucose oxime
- Q 6. Glucose reacts with Tollens reagent to give a derivative of  
 (A) monocarboxylic acid (B) dicarboxylic acid  
 (C) ketone (D) keto acid
- Q 7. The reagent which forms crystalline osazone derivative when reacted with glucose, is  
 (A) Fehling's solution (B) Benedict solution  
 (C) phenylhydrazine (D) hydroxylamine
- Q 8. Sugars are characterized by the preparation of osazone derivatives. Which sugars have identical osazones ?  
 (A) Glucose and fructose  
 (B) Glucose and arabinose  
 (C) Glucose and lactose  
 (D) Glucose and maltose
- Q 9. An example of non -reducing sugar is  
 (A) sucrose (B) maltose  
 (C) lactose (D) cellobiose
- Q 10. Glucose gives silver mirror with ammoniacal silver nitrate because it has  
 (A) ester (B) aldehyde  
 (C) ketone (D) alcoholic  $AgNO_3$
- Q 11. Fructose reduces Tollens reagent due to  
 (A) enolization of fructose followed by conversion to aldehyde by base  
 (B) primary alcoholic group

- (C) secondary alcoholic group  
(D) asymmetric carbons
- Q 12. The pair of compounds in which both the compounds give positive test with Tollen's reagent is  
(A) glucose and sucrose  
(B) fructose and sucrose  
(C) glucose and fructose  
(D) acetophenone and hexanal
- Q 13. All monosaccharides ..... Tollen's reagent  
(A) oxidize (B) condense with  
(C) reduce (D) add to
- Q 14. Which of the following hexoses will form the same osazone when treated with excess of phenyl hydrazine ?  
(A) D-glucose, D-fructose and D-galactose  
(B) D-glucose, D-fructose and D-mannose  
(C) D-glucose, D-mannose and D-galactose  
(D) D-fructose, D-mannose and D-galactose  
(E) D-glucose, D-galactose and D-talose
- Q 15. Which of the following does not show mutarotation ?  
(A) (-) Fructose (B) (+) Lactose  
(C) (+) Maltose (D) (+) Sucrose
- (A) Alanine (B) Glycine  
(C) Lovcine (D) Valine
- Q 5. Which one of the following is an essential amino acid ?  
(A) Methionine (B) Tyrosine  
(C) Alanine (D) Glycine
- Q 6. At isoelectric point, amino acids are present as  
(A)  $\text{H}_2\text{NCHRCOOH}$  (B)  $\text{H}_3\text{N}^+\text{CHRCOO}^-$   
(C)  $\text{H}_3\text{N}^+\text{CHRCOOH}$  (D)  $\text{H}_2\text{NCHRCOO}^-$
- Q 7. Which of the following statements is correct ?  
(A) All amino acids are optically active  
(B) All amino acids except glycine are optically active  
(C) All amino acids except glutamic are optically active  
(D) All amino acids except lysine are optically Active
- Q 8. One of the essential alpha amino acid is  
(A) lysine (B) glycine  
(C) serine (D) proline
- Q 9. Which is not a true statement ?  
(A)  $\alpha$ -Carbon of  $\alpha$ -amino acid is asymmetric  
(B) All proteins are found in L-form  
(C) Human body can synthesize all proteins they need  
(D) At pH = 7 both amino acid carboxylic groups exist in ionized form

Q 10. In which case, cationic form of Amino acid dominant ?

- (A)  $\text{PH} < \text{PI}$  (B)  $\text{PH} = \text{PI}$   
(C)  $\text{PH} > \text{PI}$  (D) None of these

Q 11. Among the following L-Serine is



Q 12. Lysine is least soluble in water in the pH range

- (A) 3 to 4 (B) 5 to 6  
(C) 6 to 7 (D) 8 to 9

Q 13. At pH = 4, glycine exists as

### 6. Aminoacids & its examples

- Q 1. Protein is an important constituent of our diet. It functions mainly as  
(A) a source of energy  
(B) a construction material  
(C) shock absorber  
(D) reserve food
- Q 2. The number of amino acids which form proteins in nature is about  
(A) 6 (B) 10 (C) 15 (D) 20
- Q 3. The pH value of a solution in which a polar amino acid does not migrate under the influence of electric field is called  
(A) isoelectric point (B) isoelectronic point  
(C) neutralization point (D) none of these
- Q 4. The optically inactive Amino acid is

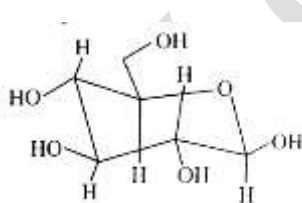
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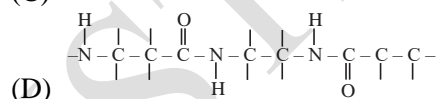
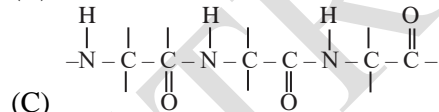
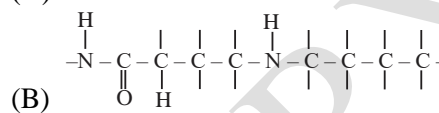
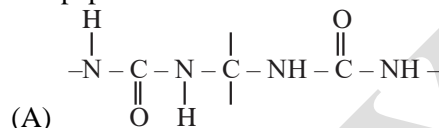
- (A)  $\text{H}_3\text{N}^+\text{-CH}_2\text{-COO}^-$   
 (B)  $\text{H}_3\text{N}^+\text{-CH}_2\text{-COOH}$   
 (C)  $\text{H}_2\text{N-CH}_2\text{-COOH}$   
 (D)  $\text{H}_2\text{N-CH}_2\text{-COO}^-$
- Q 14. Which of the following sets consists only of essential amino acids ?  
 (A) Alanine, tyrosine, cystine  
 (B) Leucine, lysine, tryptophan  
 (C) Alanine, glutamine, lysine  
 (D) Leucine, proline, glycine
- Q 15. The  $\text{pK}_{a1}$  and  $\text{pK}_{a2}$  of an amino acid are 2.3 and 9.7 respectively. The isoelectric point of the amino acid is  
 (A) 6.0 (B) 3.7 (C) 12.0 (D) 7.4
- Q 16. In an alkaline medium, glycine predominantly exist as/in a/an:  
 (A) cation (B) anion  
 (C) zwitter ion (D) covalent form
- Q 17. In aqueous solution, an amino acid exists as  
 (A) cation (B) anion  
 (C) dianion (D) Zwitter ion
- Q 18. Amino acid given characteristics purple colour with  
 (A) Tollen's reagent (B) Benedict's reagent  
 (C) Ninhydrin (D) None of these
- Q 19. The total number of basic groups in the following form of lysine



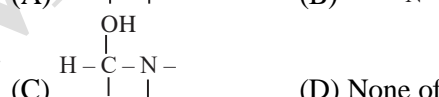
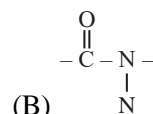
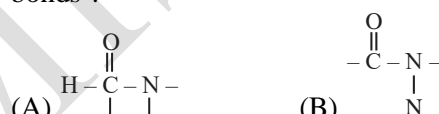
- (A) 0 (B) 1 (C) 2 (D) 3

## 7. Peptide Structure & Properties

- Q 1. Which of the following structures does represent the peptide chain ?



- Q 2. Which one is the correct representation of peptide bonds ?



(D) None of these

- Q 3. Which statement is incorrect about peptide bond?

- (A) C-N bond length in proteins is smaller than usual bond length of C-N bond  
 (B) Spectroscopic analysis shown planar structure of -CO-NH group  
 (C) C-N bond length in proteins is longer than usual bond length of C-N bond  
 (D) None of the above

- Q 4. How many tripeptides can be prepared by linking the amino acids glycine, alanine and phenyl alanine ?

- (A) One (B) Three  
 (C) Six (D) Twelve

- Q 5. There are 20 naturally occurring amino acids. The maximum number of tripeptides that can be obtained is

- (A) 6470 (B) 7465  
 (C) 5360 (D) 8000

- Q 6. The number of amino acids and number of peptide bonds in a linear tetrapeptide (made of different amino acids) are respectively

- (A) 4 and 4 (B) 5 and 5

- (C) 5 and 4 (D) 4 and 3
- Q 7. A protein is best described as a  
(A) polyamide (B) polyester  
(C) polypeptide (D) polyurethane
- Q 8. The number of tripeptides formed by three different amino acids is  
(A) five (B) six  
(C) three (D) four
- Q 9. Aspartame, an artificial sweetener, is a peptide and has the following structure:
- $$H_2N - \underset{\substack{| \\ CH_2 - COOH}}{CH} - CONH - \underset{\substack{| \\ CH_2 - C_6H_5}}{CH} - COOCH_3$$
- Identify the four functional groups  
(1) Write the zwitterionic structure.  
(2) Write the structures of the amino acids obtained from the hydrolysis of aspartame.  
(3) Which of the two amino acids is more hydrophobic? **[IIT 2001]**
- Q 10. Following two amino acids lysine and glutamic acid form dipeptide linkage. What are two possible Dipeptides?
- $$H_2N - CH_2 - CH_2 - CH_2 - CH_2 - CH(NH_2) - COOH$$
- &
- $$HOOC - CH_2 - CH_2 - CH_2 - CH(NH_2) - COOH$$
- Q 11. An example of biopolymer is  
(A) Teflon (B) Neoprene  
(C) Nylon - 6 (D) DNA
- Q 12. The number of dipeptides that can be prepared from alanine and phenylalanine is  
(A) 6 (B) 4 (C) 3 (D) 2
- (C) peptide linkage (D) all of these
- Q 3. Point out the wrong statement about proteins  
(A) They are nitrogenous organic compounds of high molecular masses  
(B) On hydrolysis by enzymes, they give amino acids  
(C) Many of them are enzymes  
(D) They do not contain polypeptide linkages
- Q 4. Protein is an important constituent of our diet. It functions mainly as  
(A) a source of energy  
(B) a construction material  
(C) shock absorber  
(D) reserve food
- Q 5. The reagent used for the detection of proteins is  
(A)  $HNO_3$  (conc) (B) Fehling's solution  
(C) Tollen's reagent (D) Baeyer's reagent
- Q 6. The sequence in which amino acids are arranged in protein is called its  
(A) primary structure (B) secondary structure  
(C) tertiary structure (D) quaternary structure
- Q 7. The bond that determines the secondary structure of a protein is  
(A) ionic bond (B) covalent bond  
(C) coordinate bond (D) hydrogen bond
- Q 8. Which of the following statements is true for proteins?  
(A) They act as antibodies  
(B) They act as hormones  
(C) They catalyse the biochemical reactions  
(D) They perform all these functions
- Q 9. Fibrous proteins are present in  
(A) wool (B) muscles  
(C) silk (D) all of these
- Q 10. Globular proteins are present in  
(A) blood (B) milk  
(C) insulin (D) all of these
- Q 11. Keratin, a fibrous protein is present in  
(A) hair and nails (B) wool  
(C) skin (D) all of these
- Q 12. Secondary structure of protein refers to  
(A) 3 - dimensional structure, specially the bond between amino acid residues that are distant from each other in the polypeptide chain  
(B) regular folding patterns of the polypeptide chain

### 8. Protein & its Structure

- Q 1. Which of the following is fibrous protein  
(A) Keratin  
(B) Insulin  
(C) Albumins  
(D) Haemoglobin
- Q 2. Main structural unit of protein is  
(A) ester linkage (B) ether linkage



- (C) regular folding patterns and structures of prosthetic groups  
 (D) Linear sequence of amino acid residues in the polypeptide chain
- Q 13. The helical structure of protein is stabilized by  
 (A) dipeptide bonds (B) hydrogen bonds  
 (C) ether bonds (D) peptide bonds
- Q 14. Which one of the following is a conjugated protein ?  
 (A) Phosphoprotein (B) Glycoprotein  
 (C) Chromoprotein (D) All of these
- Q 15. Denaturation of protein  
 (A) disrupts the primary or secondary or tertiary structure of protein  
 (B) disrupts the secondary and tertiary structures only  
 (C) disrupts all the primary, secondary, tertiary and even the quaternary structures of protein  
 (D) will not affect the original biological activity  
 (E) is always irreversible
- (iii) Enzymes catalyse chemical reactions by lowering the activation energy  
 (iv) Pepsin in proteolytic enzyme  
 (A) I (B) I and iv  
 (C) I and iii (D) ii, iii and iv
- Q 5. Starch is converted into maltose in about half an hour's time by  
 (A) zymase (B) invertase  
 (C) maltase (D) diastase
- Q 6. Enzymes are made up of  
 (A) carbohydrates  
 (B) nitrogen containing carbohydrates  
 (C) edible proteins  
 (D) proteins with specific structure
- Q 7. Starch is converted to ethanol by fermentation, the sequence of enzymes used is  
 (A) amylase, maltase, zymase  
 (B) diastase, maltase, zymase  
 (C) amylase, invertase, zymase  
 (D) amylase, zymase, maltase
- Q 8. Vitamin C is  
 (A) ascorbic acid (B) lactic acid  
 (C) citric acid (D) paracetamol
- Q 9. The vitamin that is most readily manufactured in our bodies is  
 (A) vitamin A (B) vitamin B  
 (C) vitamin C (D) vitamin D
- Q 10. Bleeding gums is generally associated with a deficiency of  
 (A) thiamine (B) ascorbic acid  
 (C) folic acid (D) vitamin E
- Q 11. Which one of the following contains cobalt ?  
 (A) Chlorophyll (B) Haemoglobin  
 (C) Vitamin C (D) Vitamin B<sub>12</sub>
- Q 12. Which of the following is found in cod-liver oil ?  
 (A) Vitamin C (B) Vitamin E  
 (C) Vitamin A (D) Vitamin B<sub>1</sub>
- Q 13. Which of the following is not a fat soluble vitamin ?  
 (A) Vitamin B complex (B) Vitamin D  
 (C) Vitamin E (D) Vitamin A
- Q 14. Which of the following is not a fat soluble vitamin ?  
 (A) Vitamin A (B) Vitamin K  
 (C) Vitamin E (D) Folic acid

### 9. Enzyme & Vitamin

- Q 1. Enzymes are  
 (A) carbohydrates (B) lipids  
 (C) proteins (D) none of these
- Q 2. The enzyme pepsin hydrolyses  
 (A) proteins to amino acids  
 (B) fats to fatty acids  
 (C) glucose to ethyl alcohol  
 (D) polysaccharides to monosaccharides
- Q 3. Which of the following statements is incorrect about enzyme catalysis ?  
 (A) Enzymes are mostly proteinous in nature  
 (B) Enzyme action is specific  
 (C) Enzymes are denatured by UV-rays and at high temperature  
 (D) Enzymes are least reactive at optimum temp.
- Q 4. Of the following statements about enzymes, which ones are true ?  
 (i) Enzymes lack in nucleophilic groups  
 (ii) Enzymes are highly specific both in binding chiral substrates and in catalyzing their reactions

- Q 15. A vitamin that contains both nitrogen & Sulphur  
 (A) Vitamin A (B) Vitamin B1  
 (C) Vitamin B2 (D) Vitamin B12
- Q 16. Identify the vitamin whose deficiency in our food decreases reproductive power  
 (A) vitamin A (B) vitamin C  
 (C) vitamin D (D) vitamin E
- Q 17. A vitamin which plays a vital role in the coagulating property of blood is  
 (A) vitamin A (B) vitamin D  
 (C) vitamin E (D) vitamin K
- Q 18. Which one of the following vitamins is water soluble?  
 (A) Vitamin K (B) Vitamin A  
 (C) Vitamin B (D) Vitamin E

### 10. Nucleic Acid- DNA & RNA

- Q 1. Which of the following base is found only in RNA and not in DNA ?  
 (A) Thymine (B) Guanine  
 (C) Uracil (D) Adenine
- Q 2. Which one of the following base found in DNA but not in RNA ?  
 (A) Cytosine (B) Guanine  
 (C) Adenine (D) Thymine
- Q 3. Bases common to RNA and DNA are  
 (A) adenine, guanine, cytosine  
 (B) adenine, uracil, thymine  
 (C) adenine, guanine, thymine  
 (D) guanine, uracil, thymine
- Q 4. The examples of nucleoside are  
 (A) adenosine (B) cytidine  
 (C) uridine (D) all of these
- Q 5. The examples of nucleotide are  
 (A) adenylic acid (B) guanylic acid  
 (C) uridylic acid (D) all of these
- Q 6. In nucleic acids, the sequence is  
 (A) base – phosphate – sugar  
 (B) base – sugar – phosphate  
 (C) sugar – base – phosphate  
 (D) phosphate – base – sugar
- Q 7. A 'base -sugar-phosphate' unit in nucleic acid is called  
 (A) base phosphate (B) phosphotide  
 (C) nucleotide (D) nucleoside
- Q 8. Nucleic acids are  
 (A) polymers of nucleosides  
 (B) polymers of nucleotides  
 (C) polymers of purine bases  
 (D) polymers of pyrimidine bases
- Q 9. RNA is a  
 (A) single helix strand  
 (B) double helix strand  
 (C) triple helix strand  
 (D) none of these
- Q 10. Which of the following is responsible for the heredity character of cell ?  
 (A) RNA (B) DNA  
 (C) Proteins (D) Hormones
- Q 11. The function of DNA is  
 (A) to synthesis RNA  
 (B) to synthesis the necessary protein  
 (C) to carry the hereditary characteristics  
 (D) All are correct
- Q 12. In transfer RNA anticodon for the messenger RNA codon G-C-A is  
 (A) C-G-U (B) G-C-U  
 (C) U-G-C (D) G-U-C
- Q 13. The reason for double helical structure of DNA is operation of  
 (A) hydrogen bonding  
 (B) electrostatic attractions  
 (C) van der Waals' forces  
 (D) dipole-dipole interaction
- Q 14. In DNA, the consecutive deoxynucleotides are connected via  
 (A) phosphomonoester linkage  
 (B) phosphodiester linkage  
 (C) phosphotriester linkage  
 (D) amide linkage

**11. DNA, RNA & its Properties**

- Q 1. The purine base present in RNA is  
(A) adenine (B) cytosine  
(C) uracil (D) thymine
- Q 2. DNA multiplication is called  
(A) translation (B) transduction  
(C) transcription (D) replication
- Q 3. The pyrimidine bases present in DNA are  
(A) cytosine and adenine  
(B) cytosine and guanine  
(C) cytosine and thymine  
(D) cytosine and uracil
- Q 4. RNA differ from DNA in respect to a base  
(A) thymine (B) adenine  
(C) cytosine (D) guanine
- Q 5. Monomer of nucleic acid is  
(A) nucleotides (B) nucleosides  
(C) amino acids (D) carboxylic acid
- Q 6. RNA and DNA are chiral molecules, their chirality is due to  
(A) chiral phosphate ester units  
(B) D-sugar component  
(C) L-sugar component  
(D) chiral bases
- Q 7. In DNA, the complimentary bases are  
(A) adenine and guanine; thymine and cytosine  
(B) uracil and adenine; cytosine and guanine  
(C) adenine and thymine; guanine and cytosine  
(D) adenine and thymine; guanine and uracil
- Q 8. The sugar moiety present in RNA molecule is  
(A)  $\beta$ -D-2-deoxyribose  
(B)  $\beta$ -D-galactose  
(C)  $\beta$ -D-fructofuranose  
(D)  $\beta$ -D-ribose  
(E)  $\beta$ -D-glucopyranose
- Q 9. Which of the statements about "Denaturation" given below are correct ?  
(i) Denaturation of proteins causes loss of secondary and tertiary structures of the proteins  
(ii) Denaturation leads to the conversion of double strand of DNA into single strand  
(iii) Denaturation affects primary structure which gets distorted  
(A) ii and iii (B) I and iii  
(C) I and ii (D) I, ii and iii
- Q 10. The most important energy carrier in the living cell is  
(A) AMP (B) ADP  
(C) UDP (D) ATP
- Q 11. Oxidation of glucose is one of the most important reactions in a living cell. What is the number of ATP molecules generated in cells from one molecule of glucose?  
(A) 36 (B) 12 (C) 18 (D) 28
- Q 12. Insulin production and its action in human body are responsible for the level of diabetes. This compound belongs to which of the following categories?  
(A) A co-enzyme (B) A hormone  
(C) An enzyme (D) An antibiotic
- Q 13. Insulin regulates the metabolism of  
(A) Minerals (B) amino acids  
(C) glucose (D) vitamins
- Q 14. Synthesis of each molecule of glucose in photosynthesis involves  
(A) 6 molecules of ATP  
(B) 8 molecules of ATP  
(C) 10 molecules of ATP  
(D) 18 molecules of ATP

## Answer Key

### 1. Carbohydrates

- |         |         |         |
|---------|---------|---------|
| (1). A  | (2). D  | (3). A  |
| (4). B  | (5). B  | (6). C  |
| (7). B  | (8). B  | (9). A  |
| (10). A | (11). C | (12). C |
| (13). B | (14). B | (15). D |
| (16). A | (17). C |         |

### 2. Glucose & Fructose

- |         |         |         |
|---------|---------|---------|
| (1). B  | (2). C  | (3). C  |
| (4). D  | (5). B  | (6). B  |
| (7). B  | (8). A  | (9). D  |
| (10). A | (11). D | (12). C |
| (13). D | (14). A | (15). B |
| (16). A |         |         |

### 3. Fructose, Sucrose

- |         |         |         |
|---------|---------|---------|
| (1). B  | (2). B  | (3). C  |
| (4). B  | (5). C  | (6). A  |
| (7). B  | (8). B  | (9). A  |
| (10). A | (11). C | (12). C |
| (13). B | (14). D | (15). D |
| (16). B | (17). D | (18). D |

### 4. Starch, Cellulose, Maltose

- |         |         |         |
|---------|---------|---------|
| (1). A  | (2). B  | (3). A  |
| (4). B  | (5). B  | (6). A  |
| (7). B  | (8). C  | (9). A  |
| (10). C | (11). A | (12). B |
| (13). A |         |         |

### 5. Test of Carbohydrates

- |         |         |         |
|---------|---------|---------|
| (1). A  | (2). D  | (3). D  |
| (4). B  | (5). C  | (6). A  |
| (7). C  | (8). A  | (9). A  |
| (10). B | (11). A | (12). C |
| (13). C | (14). B | (15). D |

### 6. Aminoacids & its examples

- |        |        |        |
|--------|--------|--------|
| (1). D | (2). A | (3). B |
| (4). A | (5). B | (6). B |

- |         |         |         |
|---------|---------|---------|
| (7). A  | (8). B  | (9). C  |
| (10). A | (11). D | (12). B |
| (13). B | (14). A | (15). B |
| (16). D | (17). C | (18). C |

### 7. Peptide Structure & Properties

- |             |         |        |
|-------------|---------|--------|
| (1). C      | (2). B  | (3). A |
| (4). C      | (5). D  | (6). D |
| (7). C      | (8). B  |        |
| (9). SUBJ.  |         |        |
| (10). SUBJ. |         |        |
| (11). B     | (12). D |        |

### 8. Protein & its Structure

- |         |         |         |
|---------|---------|---------|
| (1). A  | (2). C  | (3). D  |
| (4). B  | (5). A  | (6). A  |
| (7). D  | (8). D  | (9). D  |
| (10). D | (11). D | (12). B |
| (13). B | (14). D | (15). B |

### 9. Enzyme & Vitamin

- |         |         |         |
|---------|---------|---------|
| (1). C  | (2). A  | (3). D  |
| (4). D  | (5). D  | (6). D  |
| (7). B  | (8). A  | (9). D  |
| (10). B | (11). D | (12). C |
| (13). A | (14). D | (15). C |
| (16). D | (17). D | (18). C |

### 10. Nucleic Acid- DNA & RNA

- |         |         |         |
|---------|---------|---------|
| (1). C  | (2). D  | (3). A  |
| (4). D  | (5). D  | (6). B  |
| (7). C  | (8). B  | (9). A  |
| (10). B | (11). D | (12). A |
| (13). A | (14). B |         |

### 11. DNA, RNA & its Properties

- |         |         |         |
|---------|---------|---------|
| (1). A  | (2). D  | (3). C  |
| (4). A  | (5). A  | (6). B  |
| (7). C  | (8). D  | (9). C  |
| (10). D | (11). C | (12). B |
| (13). C | (14). D |         |