

Chapter 28

Biomolecules

- Which of the following statements is not correct?
 - Ovalbumin is a simple food reserve in egg-white.
 - Blood proteins thrombin and fibrinogen are involved in blood clotting.
 - Denaturation makes the proteins more active.
 - Insulin maintains sugar level in the blood of a human body. (NEET 2017)
- The central dogma of molecular genetics states that the genetic information flows from
 - Amino acids \rightarrow Proteins \rightarrow DNA
 - DNA \rightarrow Carbohydrates \rightarrow Proteins
 - DNA \rightarrow RNA \rightarrow Proteins
 - DNA \rightarrow RNA \rightarrow Carbohydrates (NEET-II 2016)
- The correct corresponding order of names of four aldoses with configuration given below respectively, is

$\begin{array}{c} \text{CHO} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$	$\begin{array}{c} \text{CHO} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$
$\begin{array}{c} \text{CHO} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{CH}_2\text{OH} \end{array}$	$\begin{array}{c} \text{CHO} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{CH}_2\text{OH} \end{array}$

 - L*-erythrose, *L*-threose, *L*-erythrose, *D*-threose
 - D*-threose, *D*-erythrose, *L*-threose, *L*-erythrose
 - L*-erythrose, *L*-threose, *D*-erythrose, *D*-threose
 - D*-erythrose, *D*-threose, *L*-erythrose, *L*-threose. (NEET-II 2016)
- The correct statement regarding RNA and DNA, respectively is
 - the sugar component in RNA is a arabinose and the sugar component in DNA is ribose
 - the sugar component in RNA is 2'-deoxyribose and the sugar component in DNA is arabinose
 - the sugar component in RNA is arabinose and the sugar component in DNA is 2'-deoxyribose
 - the sugar component in RNA is ribose and the sugar component in DNA is 2'-deoxyribose. (NEET-I 2016)
- In a protein molecule various amino acids are linked together by
 - peptide bond
 - dative bond
 - α -glycosidic bond
 - β -glycosidic bond. (NEET-I 2016)
- Which one given below is a non-reducing sugar?
 - Glucose
 - Sucrose
 - Maltose
 - Lactose (NEET-I 2016)
- D*(+)-glucose reacts with hydroxyl amine and yields an oxime. The structure of the oxime would be

$\begin{array}{c} \text{CH}=\text{NOH} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$	$\begin{array}{c} \text{CH}=\text{NOH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$
$\begin{array}{c} \text{CH}=\text{NOH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$	$\begin{array}{c} \text{CH}=\text{NOH} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{HO} - \text{C} - \text{H} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{H} - \text{C} - \text{OH} \\ \\ \text{CH}_2\text{OH} \end{array}$

 - (a)
 - (b)
 - (c)
 - (d) (2014)

8. Which of the following hormones is produced under the conditions of stress which stimulate glycogenolysis in the liver of human beings?
 (a) Thyroxin (b) Insulin
 (c) Adrenaline (d) Estradiol
 (2014)
9. In DNA, the linkages between different nitrogenous bases are
 (a) phosphate linkage (b) H-bonding
 (c) glycosidic linkage (d) peptide linkage
 (Karnataka NEET 2013)
10. Deficiency of vitamin B₁ causes the disease
 (a) convulsions (b) beri-beri
 (c) cheilosis (d) sterility (2012)
11. Which one of the following sets of monosaccharides forms sucrose?
 (a) α -D-galactopyranose and α -D-glucopyranose
 (b) α -D-glucopyranose and β -D-fructofuranose
 (c) β -D-glucopyranose and α -D-fructofuranose
 (d) α -D-glucopyranose and β -D-fructopyranose. (2012)
12. Which one of the following statements is not true regarding (+) lactose?
 (a) On hydrolysis (+) lactose gives equal amount of D(+) glucose and D(+) galactose.
 (b) (+) Lactose is a β -glucoside formed by the union of a molecule of D(+) glucose and a molecule of D(+) galactose.
 (c) (+) Lactose is a reducing sugar and does not exhibit mutarotation.
 (d) (+) Lactose, C₁₂H₂₂O₁₁ contains 8-OH groups (2011)
13. Which of the following is not a fat soluble vitamin?
 (a) Vitamin B complex
 (b) Vitamin D
 (c) Vitamin E
 (d) Vitamin A (Mains 2011)
14. Which of the statements about "Denaturation" given below are correct?
 (1) Denaturation of proteins causes loss of secondary and tertiary structures of the protein.
 (2) Denaturation leads to the conversion of double strand of DNA into single strand.
 (3) Denaturation affects primary structure which gets distorted.
 (a) (2) and (3) (b) (1) and (3)
 (c) (1) and (2) (d) (1), (2) and (3)
 (Mains 2011)
15. Which one of the following does not exhibit the phenomenon of mutarotation?
 (a) (+) Sucrose (b) (+) Lactose
 (c) (+) Maltose (d) (-) Fructose (2010)
16. Fructose reduces Tollen's reagent due to
 (a) asymmetric carbons
 (b) primary alcoholic group
 (c) secondary alcoholic group
 (d) enolisation of fructose followed by conversion to aldehyde by base (Mains 2010)
17. The segment of DNA which acts as the instrumental manual for the synthesis of the protein is
 (a) ribose (b) gene
 (c) nucleoside (d) nucleotide. (2009)
18. Which of the following hormones contains iodine?
 (a) Testosterone (b) Adrenaline
 (c) Thyroxine (d) Insulin (2009)
19. 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. (2008, 1998)
20. Which of the following is an amine hormone?
 (a) Insulin (b) Progesterone
 (c) Thyroxine (d) Oxypurin (2008)

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21. RNA and DNA are chiral molecules, their chirality is due to
 (a) chiral bases
 (b) chiral phosphate ester units
 (c) *D*-sugar component
 (d) *L*-sugar component.

(2007)

22. Which of the following vitamins is water-soluble?

- (a) Vitamin E (b) Vitamin K
 (c) Vitamin A (d) Vitamin B

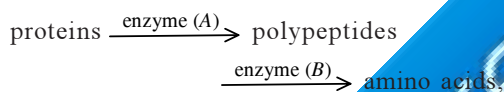
(2007)

23. The human body does not produce

- (a) enzymes (b) DNA
 (c) vitamins (d) hormones.

(2006)

24. During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process



are respectively

- (a) invertase and zymase
 (b) amylase and maltase
 (c) diastase and lipase
 (d) pepsin and trypsin. (2006)

25. Which one of the following is a peptide hormone?

- (a) Adrenaline (b) Glucagon
 (c) Testosterone (d) Thyroxine

(2006)

26. Which functional group participates in disulphide bond formation in proteins?

- (a) Thioester (b) Thioether
 (c) Thiol (d) Thiolactone

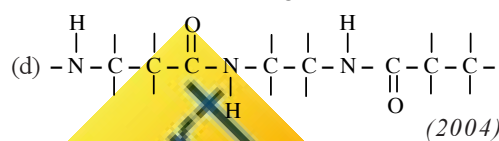
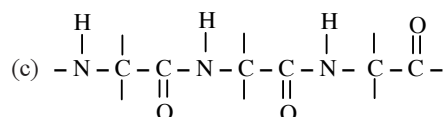
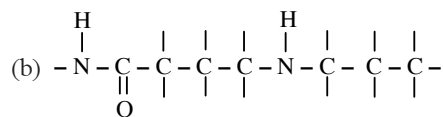
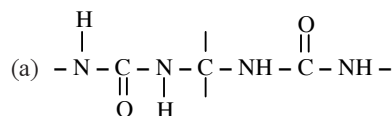
(2005)

27. The cell membranes are mainly composed of

- (a) fats (b) proteins
 (c) phospholipids (d) carbohydrates.

(2005)

28. Which of the following structures represents the peptide chain?



(2004)

29. A sequence of how many nucleotides in messenger RNA makes a codon for an amino acid?

- (a) Three (b) Four
 (c) One (d) Two (2004)

30. The hormone that helps in the conversion of glucose to glycogen is

- (a) cortisone (b) bile acids
 (c) adrenaline (d) insulin. (2004)

31. The correct statement in respect of protein haemoglobin is that it

- (a) functions as a catalyst for biological reactions
 (b) maintains blood sugar level
 (c) acts as an oxygen carrier in the blood
 (d) forms antibodies and offers resistance to diseases. (2004)

32. Number of chiral carbons in β -*D*-(+) glucose is

- (a) five (b) six
 (c) three (d) four (2004)

33. The helical structure of protein is stabilised by

- (a) dipeptide bonds (b) hydrogen bonds
 (c) ether bonds (d) peptide bonds.

(2004)

34. Vitamin B₁₂ contains

- (a) Fe (II) (b) Co (III)
 (c) Zn (II) (d) Ca (II) (2003)

35. Glycolysis is
 (a) oxidation of glucose to glutamate
 (b) conversion of pyruvate to citrate
 (c) oxidation of glucose to pyruvate
 (d) conversion of glucose to haem. (2003)
36. Phospholipids are esters of glycerol with
 (a) three carboxylic acid residues
 (b) two carboxylic acid residues and one phosphate group
 (c) one carboxylic acid residue and two phosphate groups
 (d) three phosphate groups. (2003)
37. Chargaff's rule states that in an organism
 (a) amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of cytosine (C)
 (b) amount of adenine (A) is equal to that of guanine (G) and the amount of thymine (T) is equal to that of cytosine (C)
 (c) amount of adenine (A) is equal to that of cytosine (C) and the amount of thymine (T) is equal to that of guanine (G)
 (d) amounts of all bases are equal. (2003)
38. Enzymes are made up of
 (a) edible proteins
 (b) proteins with specific structure
 (c) nitrogen containing carbohydrates
 (d) carbohydrates. (2002)
39. Which is not true statement?
 (a) α -carbon of α -amino acid is asymmetric.
 (b) All proteins are found in *L*-form.
 (c) Human body can synthesise all proteins they need.
 (d) At pH = 7 both amino and carboxylic groups exist in ionised form. (2002)
40. Which of the following is correct about H-bonding in nucleotide?
 (a) A - T, G - C (b) A - G, T - C
 (c) G - T, A - C (d) A - A, T - T (2001)
41. Which is the correct statement?
 (a) Starch is a polymer of α -glucose.
 (b) Amylose is a component of cellulose.
 (c) Proteins are composed of only one type of amino acid.
 (d) In cyclic structure of fructose, there are four carbons and one oxygen atom. (2001)
42. $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{NH}- \end{array}$ (peptide bond).
 Which statement is incorrect about peptide bond?
 (a) C - N bond length in proteins is longer than usual bond length of N - C bond.
 (b) Spectroscopic analysis shows planar structure of $\begin{array}{c} -\text{C}-\text{NH}- \\ \parallel \\ \text{O} \end{array}$ group.
 (c) C - N bond length in proteins is smaller than usual bond length of C - N bond.
 (d) None of the above. (2001)
43. Which of the following is correct?
 (a) Cycloheptane is an aromatic compound.
 (b) Diastase is an enzyme.
 (c) Acetophenone is an ether.
 (d) All of these. (2001)
44. α -D-glucose and β -D-glucose are
 (a) epimers (b) anomers
 (c) enantiomers (d) diastereomers. (2000)
45. Which one is responsible for production of energy in bio-reaction?
 (a) Thyroxine (b) Adrenaline
 (c) Oestrogen (d) Progesterone (2000)
46. Mg is present in
 (a) chlorophyll (b) haemoglobin
 (c) vitamin-D (d) vitamin-B. (2000)
47. Which of the following is the sweetest sugar?
 (a) Fructose (b) Glucose
 (c) Sucrose (d) Maltose (1999)
48. The number of molecules of ATP produced in the lipid metabolism of a molecule of palmitic acid is
 (a) 56 (b) 36
 (c) 130 (d) 86 (1998)
49. Glucose molecule reacts with *X* number of molecules of phenyl hydrazine to yield osazone. The value of *X* is
 (a) two (b) one
 (c) four (d) three (1998)
50. Haemoglobin is
 (a) a vitamin (b) a carbohydrate
 (c) an enzyme (d) a globular protein. (1997)

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51. The function of enzymes in the living system is to
(a) catalyse biochemical reactions
(b) provide energy
(c) transport oxygen
(d) provide immunity. (1997)
52. The secondary structure of a protein refers to
(a) regular folding patterns of continuous portions of the polypeptide chain
(b) three-dimensional structure, specially the bond between amino acid residues that are distant from each other in the polypeptide chain
(c) mainly denatured proteins and structures of prosthetic groups
(d) linear sequence of amino acid residues in the polypeptide chain. (1995)
53. The 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) 28 (b) 38
(c) 12 (d) 18 (1995)
54. The α -D-glucose and β -D-glucose differ from each other due to difference in carbon atom with respect to its
(a) number of OH groups
(b) size of hemiacetal ring
(c) conformation
(d) configuration. (1995)
55. Which of the following statements about enzymes are true?
(a) Enzymes catalyse chemical reactions by increasing the activation energy.
(b) Enzymes are highly specific both in binding chiral substrates and in catalysing their reactions.
(c) Enzymes lack in nucleophilic groups.
(d) Pepsin is proteolytic enzyme. (1995)
56. Chemically considering digestion is basically
(a) anabolism
(b) hydrogenation
(c) hydrolysis
(d) dehydrogenation. (1994)
57. An example of biopolymer is
(a) teflon (b) neoprene
(c) nylon-66 (d) DNA. (1994)
58. Enzymes take part in a reaction and
(a) decrease the rate of a chemical reaction
(b) increase the rate of a chemical reaction
(c) both (a) and (b)
(d) none of these. (1993)
59. The couplings between base units of DNA is through
(a) hydrogen bonding
(b) electrostatic bonding
(c) covalent bonding
(d) van der Waals forces. (1992)
60. On hydrolysis of starch, we finally get
(a) glucose (b) fructose
(c) both (a) and (b) (d) sucrose. (1991)

Answer Key

1. (c) 2. (c) 3. (d) 4. (d) 5. (a) 6. (b) 7. (d) 8. (c) 9. (b) 10. (b)
11. (b) 12. (c) 13. (a) 14. (c) 15. (a) 16. (d) 17. (b) 18. (c) 19. (c) 20. (c)
21. (c) 22. (d) 23. (c) 24. (d) 25. (b) 26. (c) 27. (c) 28. (c) 29. (a) 30. (d)
31. (c) 32. (d) 33. (b) 34. (b) 35. (c) 36. (b) 37. (a) 38. (b) 39. (b) 40. (a)
41. (a) 42. (a) 43. (b) 44. (b) 45. (a) 46. (a) 47. (a) 48. (c) 49. (d) 50. (d)
51. (a) 52. (a) 53. (b) 54. (d) 55. (b) 56. (c) 57. (d) 58. (b) 59. (a) 60. (a)