BIOLOGY

BOOKS - MTG BIOLOGY (ENGLISH)

BIOMOLECULES

Mcq

1. The four elements called "big-four" which make up 95% of all elements found in a living system are

A. C,H,O,N

B. C,H,O,P

C. C,H,O,S

D. C,N,O,P.

Answer: A

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2. Read the given statements and select the option that correctly sorts these with respect to A and B in the given flow chart.

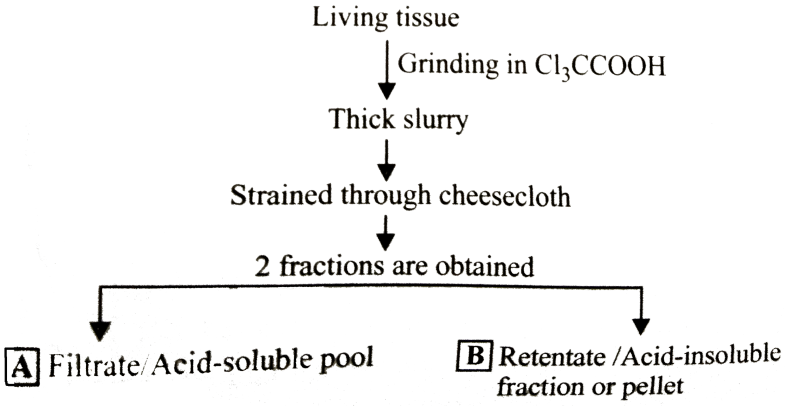
(i) Molecular weight ranging from 18 to 800 daltons (Da) approximately

(ii) Proteins, nucleic acids, polysaccharides and lipids

(iii) Contain chemicals that have molecular weight more than 800 Da

(iv) Has monomers

(v) Generally has polymers



A. A: (i),(ii),(iii) B: (iv),(v)

B. A: (ii),(iv) B: (i),(iii),(v)

C. $\begin{matrix} \text{A} & \text{B} \\ (\text{i}),(\text{iv}) & (\text{ii}),(\text{iii}),(\text{v}) \end{matrix}$

D. $\begin{matrix} \text{A} & \text{B} \\ (\text{i}),(\text{iii}),(\text{v}) & (\text{ii}),(\text{iv}) \end{matrix}$

Answer: C

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3. Take a living tissue, grind it in trichloroacetic acid using pestle and mortar, and then strain it, you would obtain two fractions : acid-soluble and acid-insoluble fraction. Acid-insoluble fraction does not contain

A. polysaccharides

B. nucleic acids

C. lipids

D. flavonoids and alkaloids.

Answer: D

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4. The inorganic compounds like sulphate, phosphate, etc., are found in

A. acid-souluble pool

B. acid-insoluble fraction

C. both (i) and (b)

D. none of these.

Answer: A

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5. The sum total composition of acid-soluble and acid-insoluble fraction represents the entire composition of

A. a) dead cells

B. b) gene pool

C. c) cellular pool

D. d) gene library.

Answer: C

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6. Biomolecules are

A. inorganic materials

B. organic materials

C. all the carbon compounds obtained from living tissues

D. only DNA and RNA.

Answer: C

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7. Biological molecules are primarily joined by

A. peptide bonds

B. ionic bonds

C. hydrogen bonds

D. covalent bonds.

Answer: D

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8. How many carbon atoms are generally used in composition of monosaccharides ?

A. 3 to 7

B. 1 to 5

C. 5 to 10

D. 5 to 15

Answer: A

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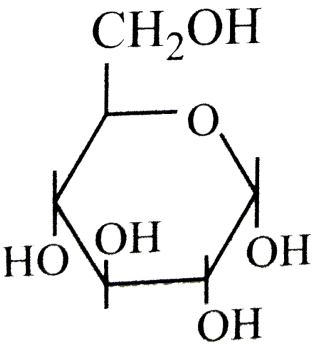
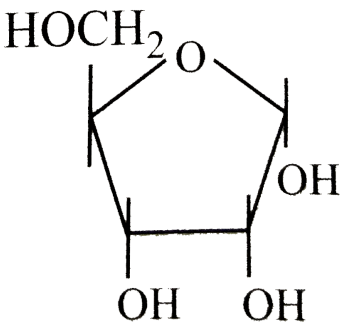
9. Which of the following options correctly identifies the structural formulae shown in figure ?



A



B

A. A: Fructose, B: Ribose

B. A: Glucose, B: Deoxyribose

C. A: Glucose, B: Ribose

D. A: Glucose, B: Fructose

Answer: C

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10. Match column I with column II and select the correct option from the given codes.

	Column I	Column II
$A.$	Tetrose sugar	(i)Galactose
$B.$	Pentose sugar	(ii)Maltose
$C.$	Hexose sugar	(iii)Erythrose
D	Disaccharide	(iv)Ribose
		(v)Sedoheptulose

A. $a)A-(v), B-(iv), C(iii), D-(i), (ii)$

B. b) $A-(iii), B-(iv), C(v), D-(ii)$

C. c) $A-(iii), B-(iv), C(i), D-(ii)$

D. d)$A-(i), (ii), B-(iv), C(iii), D-(v)$

Answer: C

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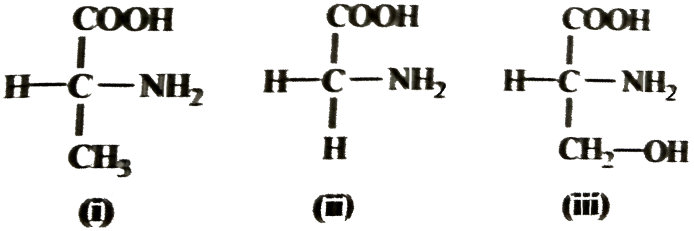
11. Identify the amino acids given below and select the correct option.



A. (i) Glycine (ii) Serine (iii) Alanine

B. (i) Alanine (ii) Glycine (iii) Serine

C. (i) Alanine (ii) Serine (iii) Glycine

D. (i) Serine (ii) Alanine (iii) Glycine

Answer: B

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12. The 20 different amino acids have different

A. R-groups

B. carboxylic groups

C. peptide bonds

D. amino groups.

Answer: A

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13. Which of the following is the correct match ?

	Acid amino acid	Basic amino acid	Neutral amino acid
A.	Glutamic acid	Lysine	Valine
	Acid amino acid	Basic amino acid	Neutral amino acid
B.	Lysine	Valine	Glutamic acid
	Acid amino acid	Basic amino acid	Neutral amino acid
C.	Glutamic acid	Valine	Lysine
	Acid amino acid	Basic amino acid	Neutral amino acid
D.	Lysine	Glutamic acid	Valine

Answer: A

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14. Acidic amino acids have two-COOH groups and one $-NH_2$ group per molecule. Select the pair that consists of acidic amino acids.

A. Aspartic acid, glutamic acid

B. Lysine, arginine

C. Glycine, alanine

D. Both (a) and (b)

Answer: A

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15. An example of aromatic amino acid is

A. tyrosine

B. phenylalanine

C. trytophan

D. all of these

Answer: D

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16. Essential amino acids include

A. leucine

B. valine

C. tryptophan

D. all of these

Answer: D

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17. Which of the following statements about amino acids is incorrect ?

A. Essential amino acids are not synthesised in the body, therfore have to be provided in the diet.

B. Leucine, isoleucine, lysine, valine are essential amino acids.

C. Cysteine and methionine are sulphur containing amino acids.

D. Lysine and arginine are acidic amino acids.

Answer: D

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18. Saturated fatty acids possess ____bonds between carbon atoms and are _____ at room temperature.

A. singel, solids

B. double, solids

C. single, liquids

D. double, liquids

Answer: A

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19. Which of the following is a saturated fatty acid?

A. Oleic acid

B. Linoleic acid

C. Arachidonic acid

D. Palmitic acid

Answer: D

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20. Triglycerides are fatty acid esters of glycerol, which are formed by the esterification of ___ molecule (s) of fatty acids with ___ molecule(s) of glycerol.

A. one, two

B. one, three

C. three, one

D. two, one

Answer: C

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21. Which of the following is a triglyceride ?

A. Wax

B. Phospholipid

C. Oil

D. Steroid

Answer: C

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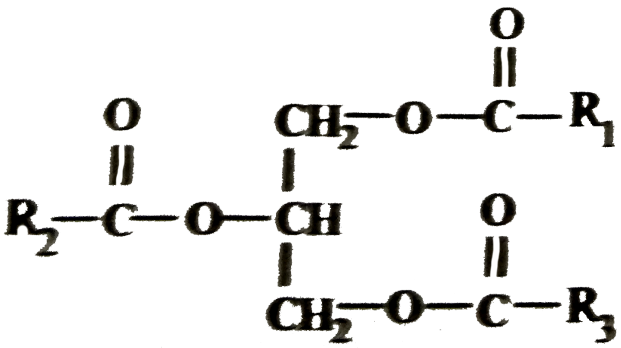
22. Given molecular formula belongs to which of the following groups of biomolecules ?



A. Carbohydrates

B. Proteins

C. Nucleic acids

D. Triglycerides

Answer: D

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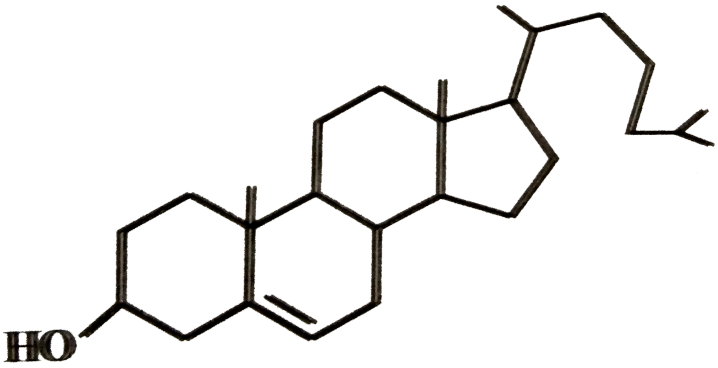
23. Given structural formula is correctly identified along with its related function by which of the following options ?



A. Cholesterol- A component of animal cell membrane

B. Lecithin - A component of cell membrane

C. Triglycide- An energy source

D. Adenosine - A component of nucleic acids

Answer: A

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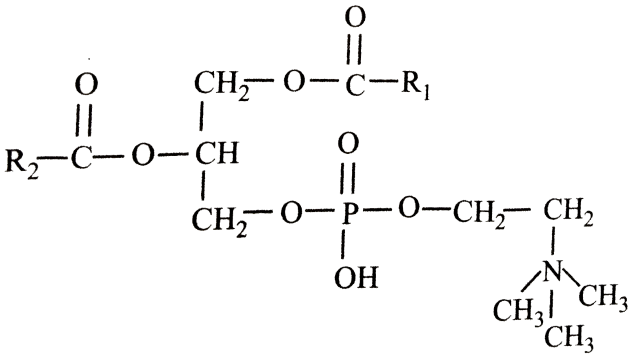
24. Given structural formula is correctly identified along with its related function by which of the following options ?



A. Cholesterol- A component of animal cell membrane

B. Lecithin - A component of cell membrane

C. Triglycide- An energy source

D. Adenosine - A component of nucleic acids

Answer: B

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25. Lecithin is a

A. sterol

B. glycolipid

C. phospholipid

D. sphingolipid.

Answer: C

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26. An unknown liquid collected from a sample of peas, is added to a beaker of water and is vigorously shaken. After few minutes, water and the unknown liquid made two separate layers. To which class of biomolecules, does the unknown liquid most likely belongs ?

A. polysaccharides

B. Proteins

C. lipids

D. Enzymes

Answer: C

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27. The component present in both nucleotides and nucleosides is

A. sugar

B. phosphate

C. nitrogenous base

D. both (a) and (b)

Answer: D

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28. Cytidine is a

A. nitrogenous base

B. nucleoside

C. nucleotide

D. nucleic acid.

Answer: B

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29. Refer to the given reactions.

(i) Adenine $+X \rightarrow$ Adenosine

(ii) Adenosine $+Y \rightarrow$ Adenylic acid

What does X and Y represent here ?

A. a) $\begin{matrix} \text{X} & \text{Y} \\ \text{Phosphate} & \text{Sugar molecule} \end{matrix}$

B. b) $\begin{matrix} \text{X} & \text{Y} \\ \text{Sugar molecule} & \text{Phosphate group} \end{matrix}$

C. c) X: Sugar molecule; Y: Nitrogenous base

D. d) X: Nitrogenous base; Y: Sugar molecule

Answer: B

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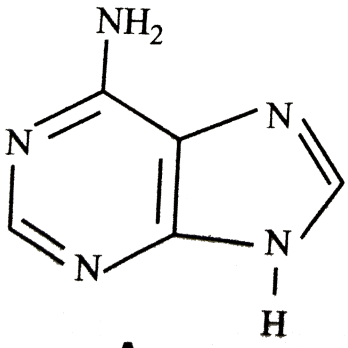
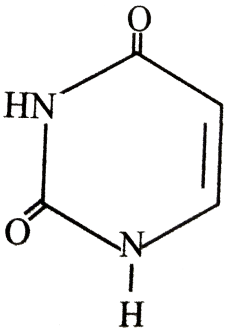
30. Identify the given structural formulae and select the correct option.



A



B

A. A: Adenine; B: Uracil

B. A: Guanine; B: Thymine

C. A: Adenine; B: Guanine

D. A: Cytosine; B: Thymine

Answer: A

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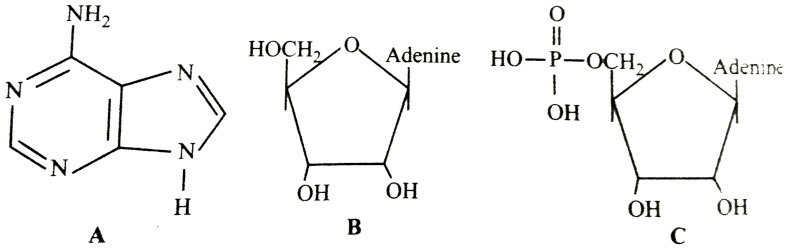
31. The three structural formulae A, B and C are given here. Identify them and select the correct option.



A.

$($ $A,$ $B,$ $C), ((a)$Adenine, Adenosine, Adenylic acid$), ($

(N-base)","(Nucleotide)","(Nucleoside)"):}`

B.

$($ $A,$ $B,$ $C), ((a)$Adenine, Adenosine, Adenylic acid$), ($

(N-base)","(Nucleotide)","(Nucleotide)"):}`

C.

$(\quad A, \quad B, \quad C), ((a)\text{Adenosine, Adenylic acid, Adenine}), ($

(Nucleoside)","(Nucleotide)","(N-basie)":}`

D.

$(\quad A, \quad B, \quad C), ((a)\text{Adenosine, Adenylic acid, Deoxyadenyli}$

(Nucleoside)","(Nucleotide)",):}`

Answer: B

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32. Adenosine, guanosine, thymidine, uridine, cytidine are all ___ but adenylic acid, guanylic acid, uridylic acid, cytidylic acid are _____.

A. nucleotides, nucleosides

B. nucleosides, nucleotides

C. nucleotides, nucleic acids

D. nucleosides, nucleic acid

Answer: B

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33. Match column I with column II and select the correct option from the given codes.

Column I (Category)	Column II (secondary metaboliteis)
A. Pigments	(i)Concanavalin A
B. Terpenoides	(ii)Monoterpenes, diterpenes
C. Alkalods	(iii)Morphine, codeine
D. Lectins	(iv)Carotenoids, anthocyanins

A. $A-(iv), B-(ii), C-(iii), D-(i)$

B. $A-(iv), B-(iii), C-(ii), D-(i)$

C. $A-(iv), B-(i), C-(iii), D-(ii)$

D. $A-(i), B-(iii), C-(ii), D-(iv)$

Answer: A

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34. Which of the following secondary metabolites are used as drugs ?

A. Abrin and ricin

B. Vinblastin and curcumin

C. Anthocyanins

D. Gums and cellulose

Answer: B

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35. Which of the following are alkaloids ?

A. Cellulose

B. Codeine

C. Morphine

D. Both (b) and (c)

Answer: D

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36. Select the incorrect match from the following .

A. Terpenoids - Monoterpenes

B. Lectins - Concanavalin A

C. Toxins - Anthocyanins

D. Drugs - Vinblastin

Answer: C

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37. Study the given statements and select the correct option.

Carbohydrates, proteins, nucleic acids and lipids are primary metabolites.

Alkaloids, floavonoids, rubber, etc., are secondary metabolites.

Linoleic, linolenic and palmitic acids are the three essential fatty acids.

A. Statements (i) and (ii) are correct.

B. Statements (i) and (iii) are incorrect.

C. Statements (i) and (iii) are correct.

D. Only statement (ii) is incorrect.

Answer: A

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38. Match column I with column II and select the correct option from the given codes.

	Column I	Column II
$A.$	Galactose	(i)Protein
$B.$	Anticoagulant	(ii)Phospholipid
$C.$	Fructose	(iii)Brain sugar
$D.$	Lecithin	(iv)Heparin
$E.$	Insulin	(v)Fruit sugar

A. $A-(v), B-(iii), C-(ii), D-(i), E-(iv)$

B. $A-(v), B-(iii), C-(i), D-(iv), E-(ii)$

C. $A-(i), B-(ii), C-(iii), D-(v), E-(iv)$

D. $A-(iii), B-(iv), C-(v), D-(ii), E-(i)$

Answer: D

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39. The correct order of chemical composition of living tissues/cells in term of percentage of the total cellular mass is

A. nucleic acids $>$ proteins $>H_2O>$ carbohydrates $>$ Ions $>$ iipids

B. H_2O > proteins > nucleic acids > carbohydrates > lipids > ions

C. H_2O > proteins > carbohydrates > nucleic acids > Lipids > ions

D. lipids > ions > carbohydrates H_2O > proteins > nucleic acids

Answer: B

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40. Match the column I with column II and choose the correct combination from the options given.

Column I (Component)	Column II (% of the total cellular mass)
A. Ions	$(i)1$
B. Lipids	$(ii)2$
C. Carbohydrates	$(iii)3$
D. Nucleic acids	(iv)5-7
E. Proteins	(v)10-15

A. $A-(i), B-(ii), C-(iii), D-(iv), E-(v)$

B. $A-(ii), B-(iii), C-(i), D-(v), E-(iv)$

C. $A-(iii), B-(i), C-(ii), D-(iv), E-(v)$

D. $A-(iv), B-(ii), C-(iii), D-(v), E-(i)$

Answer: A

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41. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Glut	(i)Intercellular ground substance
B. Antibody	(ii)Enzyme
C. Collagen	(iii)Hormone
D. Trypsin	(iv)Fights infectious agents
E. Insulin	(v)Enables glucose transport in cells

A. $A-(i), B-(ii), C-(iii), D-(iv), E-(v)$

B. $A-(v), B-(iv), C-(i), D-(ii), E-(iii)$

C. $A-(v), B-(iv), C-(iii), D-(ii), E-(i)$

D. $A-(ii), B-(i), C-(iv), D-(v), E-(iii)$

Answer: B

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42. _____ is the most abundant protein in animal world and ____ is the most abundant protein in the whole biosphere.

A. Collagen, RuBisCO

B. Collagen, keratin

C. Keratin, RuBisCO

D. Keratin, collagen

Answer: A

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43. What will be the molecular formula of a polypeptide consisting of 10 glycine when the formula of glycine is `C_(2)H_(5)O_(2)N_ ?

A. $C_6H_{12}ON_5$

B. $C_{20}H_{32}O_{11}N_{10}$

C. $C_{30}H_{16}O_6N_{10}$

D. $C_{25}H_{16}O_6N_5$

Answer: B

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44. Read the given statement and select the option that correctly identifies X and Y.

In a glycogen molecule, successive glucose units are joined together by X and branches are linked together by Y.

A. $\underset{1,4-\alpha-\text{glycosidic bonds}}{\text{X}} \qquad \underset{1,4\text{-}\alpha-\text{glycosidic acid}}{\text{Y}}$

B. X: $1,4-\alpha-$ glycosidic bonds; Y: $1,6-\alpha-$ glycosidic bonds

C. X: $1,6-\alpha-$ glycosidic acid; Y: $1,4-\alpha-$ glycosidic acid

D. X: $1,6-\alpha-$ glycosidic acids; Y: $1,6-\alpha-$ glycosidic acid

Answer: B

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45. The polysaccharides made up of glucose monomers are

A. sucrose, lactose, maltose

B. chitin, glycogen, starch

C. starch, glycogen, cellulose

D. starch, inulin, peptidoglycan.

Answer: C

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46. Study the given statements and select the correct answer.

(i) Cellulose is a homospolymer of glucose.

(ii) Inulin is a homopolymer of fructose.

(iii) Starch gives blue colour and glycogen gives red colour with iodine solution.

(iv) Cellulose gives no colour with iodine solution.

A. Statements (i), (ii) and (iii) are correct.

B. Statements (i),(ii) and (iv) are correct.

C. Statements (ii) and (iii) are correct.

D. All statements are correct.

Answer: D

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47. Study the given statements and select the correct answer.

(i) Right end of a polysaccharide chain is called reducing end while left

end is called non-reducing end.

(ii) Starch can hold cellulose being non-helical, cannot hold iodine.

(iii) Starch and glycogen are branched molecules. (iv) Starch and glycogen are the reserve food materials of plants and animals, respectively.

A. Statements (i) and (ii) are correct.

B. Statements (ii) and (iii) are correct.

C. Only statement (iv) is correct.

D. All statements are correct.

Answer: D

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48. Which of the following is a heteropolymer ?

A. Cellulose

B. Peptidoglycan

C. Starch

D. Glycogen

Answer: B

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49. Which of the following statements is not correct regarding chitin ?

A. It is a storage polysaccharide.

B. It is a homopolysaccharide.

C. It is a constituent of arthropod exoskeleton and fungal cell wall.

D. It is the second most abundant carbohydrate on earth.

Answer: A

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50. Read the given statements.

(i) Fructose is the sweetest sugar.

(ii) Glycine is the simplest amino acid.

(iii) Lactose is a disaccharide composed of one molecule each of glucose and galactose.

(iv) Cellulose is an unbranched chain of glucose molecules linked by $\beta - 1,4$-glycosidic bond.

Which of the given statements are correct ?

A. (i) and (ii)

B. (iii) and (iv)

C. (i), (ii) and (iii)

D. (i),(ii),(iii) and (iv)

Answer: D

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51. In a DNA molecule, the phosphate group is attached to _____ cabon of the sugar residue of its own nucleotide and ____ carbon of the sugar residue of the next nucleotide by _____ bonds.

A. 5', 3', phosphodiester

B. 5',3', glycosidic

C. 3',5', phosphodiester

D. 3', 5', glycosidic

Answer: A

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52. Purines have nitrogen atoms at ____ positions.

A. 1', 3', 7', 9'

B. 1', 5', 7', 9'

C. 1', 3'

D. 1', 9'

Answer: A

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53. Pyrimidines have nitrogen atoms at ____ positions.

A. 1', 3', 7', 9'

B. 1', 5', 7', 9'

C. 1', 3'

D. 1', 9'

Answer: C

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54. B-DNA which is right -handed double helix contains _____ base pairs per turn of the helix and each tum is ____ long .

A. 10, 3.4 Å

B. 10, 34 Å

C. 11, 20 Å

D. 11, 34 Å

Answer: B

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55. Which of the following is an incorrect match ?

A. a) Purines - Adenine, guanine

B. b) Pyrimidines - Cytosine, thymine

C. c) Structural polysaccharides - Inulin

D. d) Storage polysaccharides - Starch

Answer: C

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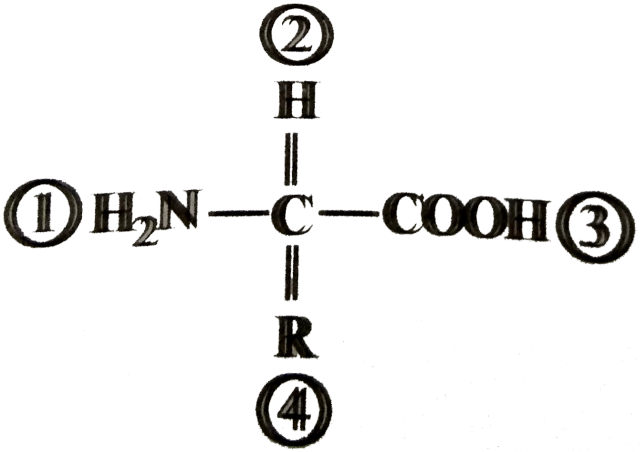
56. Which of the two groups of the given formula is involved in peptide bond formation between different amino acids ?



A. a) 2 and 3

B. b) 1 and 3

C. c) 1 and 4

D. d) 2 and 4

Answer: B

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57. Primary structure of proteins is due to the presence of

A. peptide bonds

B. disulphide (S-S) linkages

C. hydrogen bonds

D. ionic bonds

Answer: A

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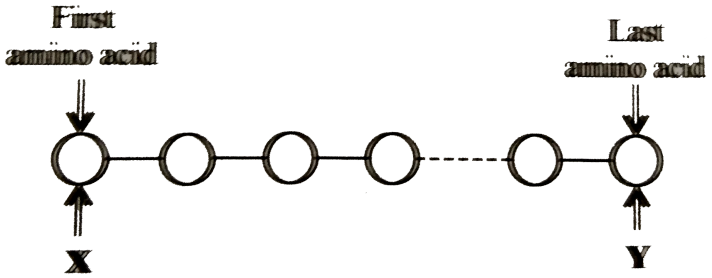
58. Identify X and Y in the given sequence.



A. N- terminal amino acid C- terminal amino acid

B. N- terminal amino acid N- terminal amino acid

C. C- terminal amino acid N- terminal amino acid

D. C- terminal amino acid C- terminal amino acid

Answer: A

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59. At some points a protein molecule may be folded back on itself. This called ____ structure and folds or coils are held together in place by _____.

A. a) 2°, H-bonds

B. b) 2°, peptide bonds

C. c) 3°, H-bonds

D. d) 1°, peptide bonds

Answer: A

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60. An α- helix is the example of which type of protein structure ?

A. a) Primary

B. b) Secondary

C. c) Tertiary

D. d) Quaternary

Answer: B

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61. A β-pleated sheet organisation in a polypeptide chain is an example of

A. a) 1° structure

B. b) 2° structure

C. c) 3° structure

D. d) 4° structure.

Answer: B

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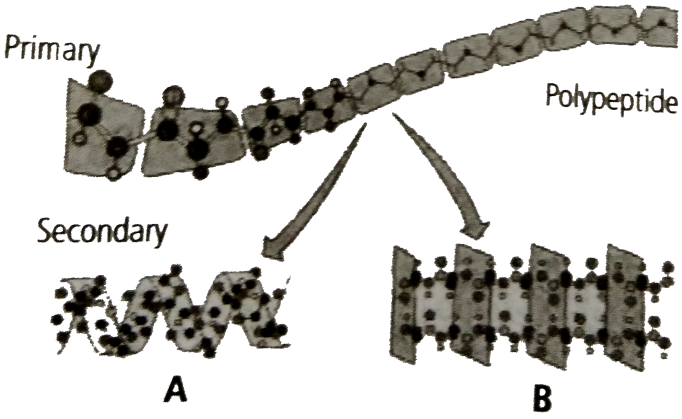
62. Refer to the given figure.

Formation of structures A and B could be due to



A. a)

A	B
Formation of peptide bonds	Linking together of two or more polyp

B. b)

A	B
Formation of hydrogen bonds	Linking together of two or more pol

C. c)

A	B
Formation of hydrogen bonds	Formation of hydrogen bonds

D. d)

A	B
Formation of peptide bonds	Formation of peptide bonds

Answer: B

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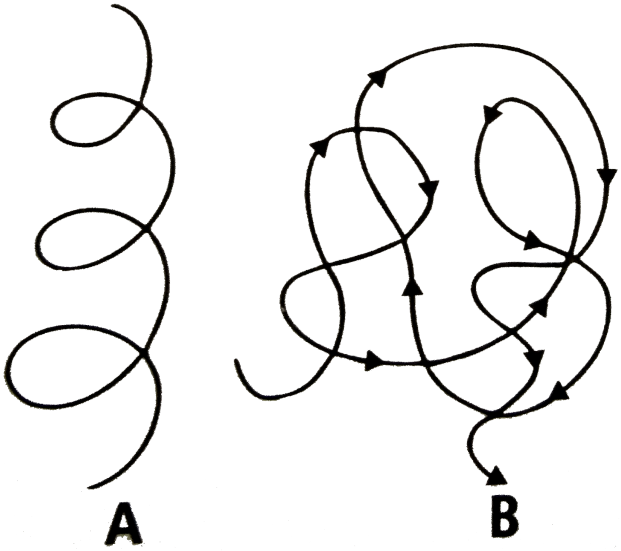
63. Recognise the figure and find out the correct matching.



A. A- Primary structure, B-Secondary structure

B. A-Secondary structure, B- Primary structure

C. A-Secondary structure, B- Tetiary structure

D. A-Tertiary structure, B-Quaternary structure

Answer: C

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64. Adult human haemolgobin consists of

A. 2 subunits (α, α)

B. 2 subunits (β, β)

C. 4 subunits $(2\alpha, 2\beta)$

D. 3 subunits $(2\alpha, 1\beta)$

Answer: C

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65. Read the given statements and select the correct option.

Statement 1 : Hemoglobin is an example of quatenary structure of proteins.

Statement 2 : Hemoglobin molecule is composed of four polypeptide chains-twoα-chains and two β-chains.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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66. Keratin present in hair shows secondary structure known as

A. parallel β-sheet

B. antiparallel β-sheet

C. α-helix

D. none of these.

Answer: C

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67. Select the option that correctly identifies the chemical bonds present in the given biomolecules.

Polysaccharides-A, Proteins-B, Fats-C, Water -D

A. A Ester B Peptide C Glycosidic D Hydrogen

B. A Glycosidic B Peptide C Ester D Hydrogen

C. A Glycosidic B Peptide C Hydrogen D Ester

D. A Hydrogen B Ester C Peptide D Glycosidic

Answer: B

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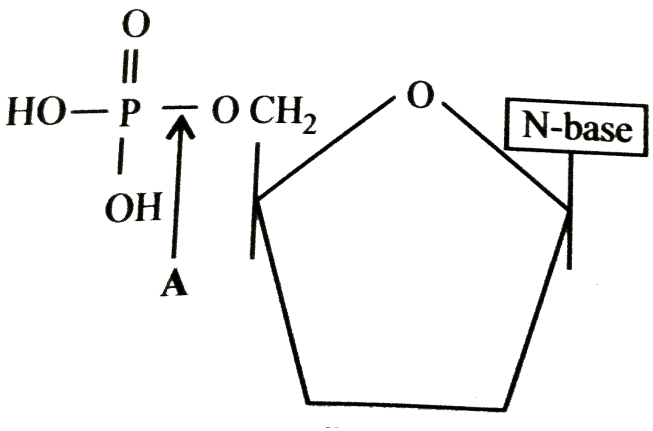
68. What does A represent in the given diagram of a nucleotide ?



A. Glycosidic bond

B. Phosphate bond

C. Ester bond

D. Ionic bond

Answer: C

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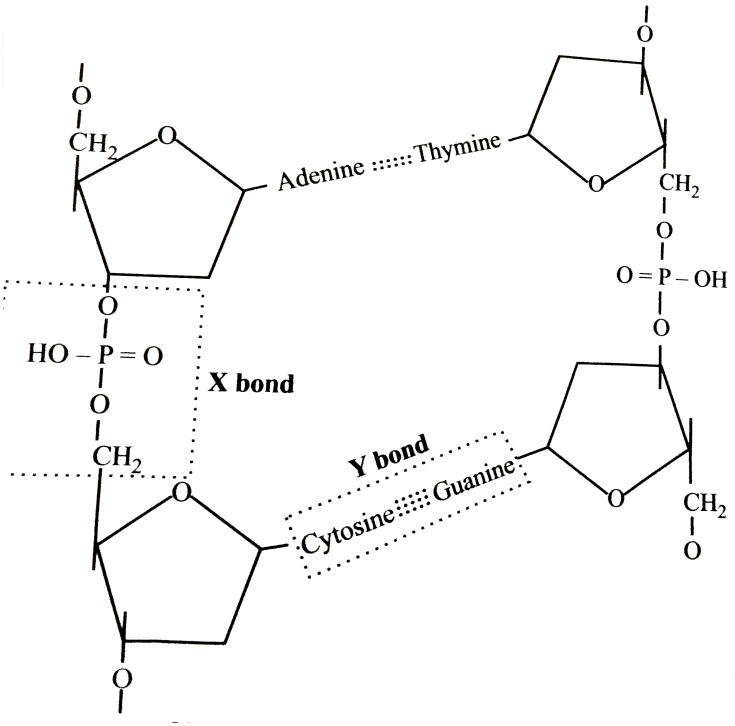
69. Which bonds are indicated by X and Y in the given diagram ?



A. X Glycosidic bond Y Hydrogen bond

B. X Phosphodiester bond Y Hydrogen bond

C. X Glycosidic bond Y Phosphodiester bond

D. X Phosphodiester bond Y Glycosidic bond

Answer: B

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70. Read the following statements and select the correct option.

Statement 1 : All biomolecules have a turn over.

Statement 2 : One type of biomolecule changes into some other type of biomolecule.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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71. The regulation by an organism of chemical composition of its blood and body fluids and other aspects of its internal environment so that

physiological processes can proceed at optimum rates is called

A. a) metabolism

B. b) enthalpy

C. c) entropy

D. d) homeostasis.

Answer: D

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72. The proteins which hasten the rate of a given metabolic conversation are called

A. a) haemoglobins

B. b) metabolites

C. c) enzymes

D. d) none of these.

Answer: C

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73. In an enzyme, active sites/pockets/crevies are present on

A. 1° structure

B. 2° structure

C. 3° structure

D. all of these

Answer: C

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74. Enzymes catalyse the biochemical reactions by ___ the activation energy.

A. lowering

B. increasing

C. unaltering

D. either (a) or (b)

Answer: A

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75. Read the given statements and select the correct option.

Statement 1 : Low temperature destroys enzymes by causing their denaturation.

Statement 2 : High temperature preserves the enzymes in their inactive state.

A. Both statements 1 and 2 are correct.

B. Statements 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: D

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76. Read the lgiven statements and select the correct option .

Statement 1 : Ribozymes are RNA molecules which catalyse the synthesis of certain specific RNAs and removal of introns from mRNA.

Statement 2 : Ribozymes are proteinaceous enzymes.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: B

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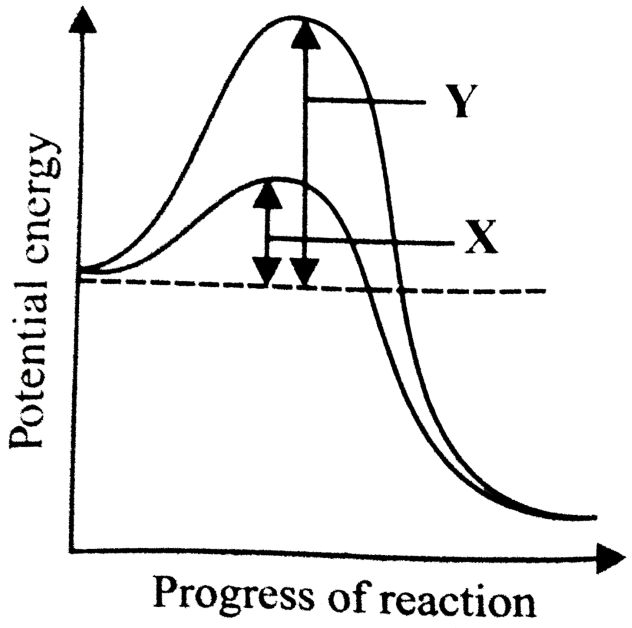
77. What is denoted by and Y in the given graph ?



A.

X Y

Activation energy without enzyme Activation energy with enzym

B.

X Y

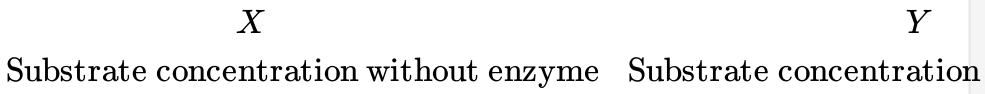
Activation energy with enzyme Activation energy without enzym

C.

X Y

Substrate concentration with enzyme Substrate concentration wit

D.



Answer: B

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78. Which of the following statements is incorrect regarding enzymatic activity ?

A. a) It increases with increase in substrate concentration upto to the saturation point.

B. b) It is highest at optimum pH value.

C. c) It initially decreases with increase in pH value.

D. d) It initially increases with increase in temperature and then decreases

Answer: C

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79. Which of the following statements about enzymes are correct ?

(i) Enzymes do not alter the overall change in free energy for a reaction.

(ii) Enzymes are proteins whose three dimensional energy.

(iii) Enzymes speed up reactions by lowering activation energy.

(iv) Enzymes are highly specific for reactions.

(v) The energy input needed to start a chemical reaction is called activation energy.

A. (i) and (v)

B. (ii) and (iv)

C. (i),(ii) and (iv)

D. All of these

Answer: D

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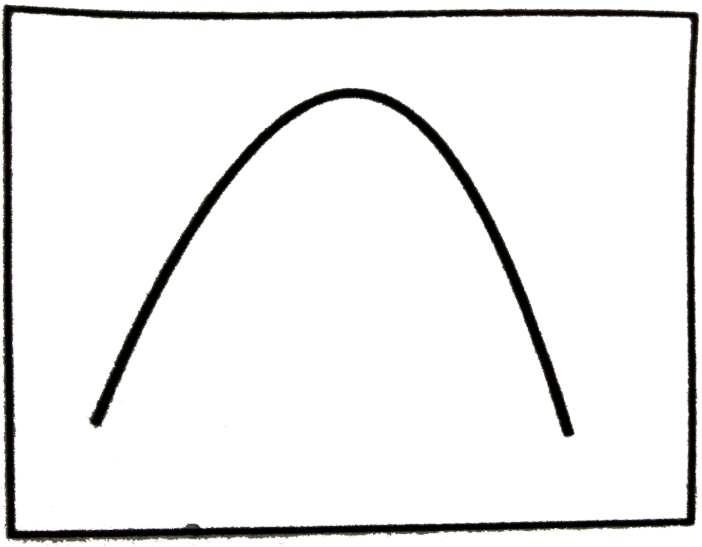
80. Select the right option regarding the given graph.



A. $X-$ axis Rate of reaction $Y-$ axis Enzymatic activity

B. $X-$ axis Enzymatic activity $Y-$ axis Rate of reaction

C. $X-$ axis Enzymatic activity $Y-$ axis $\mathrm{pH}/\mathrm{Temperature}$

D. $X-$ axis $\mathrm{pH}/\mathrm{Temperature}$ $Y-$ axis Enzymatic activity

Answer: C

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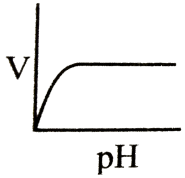
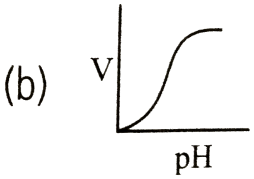
81. Which one of the given graphs shows the effect of pH on the velocity of a typical enzymatic reaction (V) ?

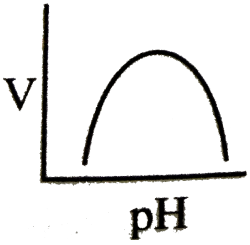
A.



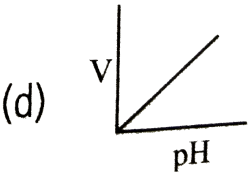
B.



C.



D.



Answer: C

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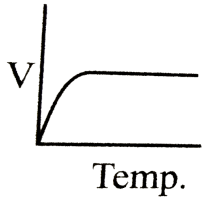
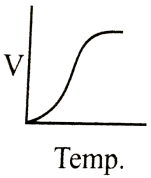
82. Which one of the given graphs shows the effect of temperature on the velocity of a typical enzymatic reaction ?

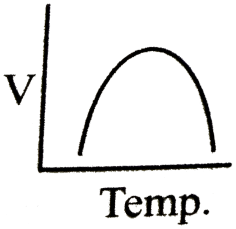


A.

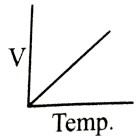
(b)



B.



C.

(d) 

D.

Answer: C

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83. Enzymes are most functional within the temperature range of

A. $15 - 25^{\circ} C$

B. $20 - 30^{\circ} C$

C. $30^{\circ} - 50^{\circ} C$

D. $50 - 60^{\circ} C$

Answer: C

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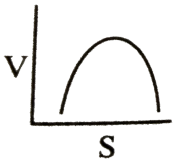
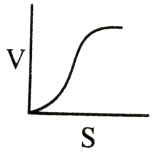
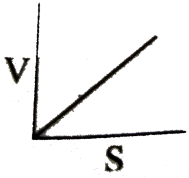
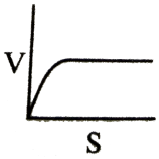
84. Which of the following graphs shows the relationship between the rate of an enzymatic activity and substrate concentration (S) ?

A. a) 

B. (b) 

C. c) 

D. (d) 

Answer: D

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85. Michaelis Menten Constant (K_m) is equal to

A. the rate of reaction

B. the rate of enzymatic activity

C. substrate concentration at which the reaction attains half of its maximum velocity

D. substrate concentration at which the rate of reaction is maximum.

Answer: C

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86. The inhibitor which closely resembles the substrate in its molecular structure and inhibits the enzyme activity by biniding to the active site of the enzyme is called

A. feedback inhibitor

B. non-competitive inhibitor

C. competitive inhibitor

D. allosteric modulator.

Answer: C

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87. inhibition of succinate dehydrogenase by malonate is an example of

A. non-competitive inhibition

B. competitive inhibition

C. allosteric inhibition

D. negative feedback.

Answer: B

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88. The inhibitor which does not resemble the substrate in structure and binds to the enzyme at site other than the active site is called

A. competitive inhibitor

B. non-competitive inhibitor

C. activator

D. substrate analogue.

Answer: B

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89. Feedback inhibition of an enzyme is influenced by

A. enzyme itself

B. external factors

C. end product

D. substrate.

Answer: C

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90. Refer to the given reactin.

$$\underset{\text{Maltose}}{C_{12}H_{22}O_{11}} + H_2O \xrightarrow{Enzyme\,A} \underset{\text{Glucose}}{2C_6H_{12}O_6}$$

Enzyme A used in the reaction, belongs to which class of enzymes ?

A. Dehydrogenases

B. Transferases

C. Hydrolases

D. Lyases

Answer: C

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91. Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis, and addition of groups to double bonds, are called

A. ligases

B. lyases

C. hydrolases

D. dehydrogenases.

Answer: B

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92. Dihydroxyacetone-3 phosphate and glyceraldehyde-3-phosphate are interconvertible. The enzyme responsible for this interconversion belongs to the cateogry of

A. isomerases

B. ligases

C. lyases

D. hydrolases.

Answer: A

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93. Which of the following is an example of isozyme ?

A. α-amylase

B. Glucokinase

C. Lactate dehydrogenases

D. All of these

Answer: D

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94. Holoenzyme is the complete enzyme consisting of an apoenzyme and a co-factor. Select the option that correctly identifies the nature of apoenzyme and co-factor.

A. Apoenzyme Co-factor
Protein Non-protein

B. Apoenzyme Co-factor
Non-protein Protein

C. Apoenzyme Co-factor
Protein Protein

D. Apoenzyme Co-factor
Non-protein Non-protein

Answer: A

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95. The proteinaceous molecule that joins a non-protein prosthetic group to form a functional enzyme, is called

A. apoenzyme

B. co-factor

C. holoenzyme

D. isoenzyme.

Answer: A

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96. Read the given paragraph with few blanks.

Prosthetic groups are $\underline{(i)}$ compunds distinguished from other co-factors in being $\underline{(ii)}$ bound to the apoenzyme. For example, in peroxidase and $\underline{(iii)}$ which catalyse the breakdown of hydrogen peroxide to water and $\underline{(iv)}$, $\underline{(v)}$ is the prosthetic group.

Select the option that correctly fills blanks in the above paragraph.

A. a)

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
organic	tightly	catalase	oxygen	haem

B. b)

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
inorganic	loosely	catalase	hydrogen	haem

C. c)

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
inorganic	tightly	isomerase	hydrogen	haem

D. d)

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
organic	loosely	isomerase	oxygen	haem

Answer: A

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97. Co-enzyme nicotinamide adenine dinucleotide (NAD) contains vitamin

A. thiamine

B. niacin

C. riboflavin

D. none of these.

Answer: B

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98. Zinc is a co-factor for proteolytic enzyme _____.

A. carboxypeptidase

B. isocitrate

C. fumarase

D. all of these

Answer: A

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99. Select the incorrect statement from the following.

A. Prosthetic groups are inorganic compounds which tightly bind with the apoenzyme.

B. Coenzymes are organic compounds but their association with apoenzyme is only transient.

C. Coenzymes serve as co-factors in number of enzyme catalysed reactions.

D. All of these

Answer: A

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100. Read the given statements and select the correct option.

Statement 1 : Co-factors play a crucial role in the catalytic activity of the enzyme.

Statement 2: Catalytic activity is lost when co-factor is removed from the enzyme.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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101. Biochemical reagents are widely used for detection of biomolecules. A reagent that specifically detects a carbonyl group (C=0) in a biomolecule will yield a positive test with

A. protein

B. fatty aicd

C. carbohydrate

D. all of these

Answer: B

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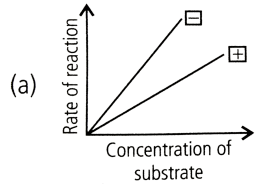
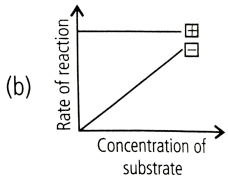
102. Which of the following graphs correctly indicates the reaction in presence (indicated bt +) and absence (indicated as -) of an enzyme ?

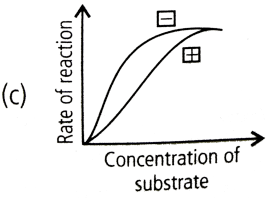
A.



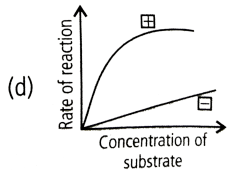
B.



C.



D.



Answer: D

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103. Which of the following graphs correctly indicates the reaction in presence (indicated bt +) and absence (indicated as -) of an enzyme ?

A. P,Q,R and S represent the same reaction carried out in the presence of enzyme, and low temperature, respectively.

B. Q and S represent the same reaction carried out at high and low temperatures, respoectively.

C. R and S represent the same reaction carried out in the presence and absence of catlyst, respectively.

D. P and R represent the same reaction carried out in the absence and presence of enzyme, respectively.

Answer: D

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104. Refer to the given graph showing relationship between temperature and enzyme action.

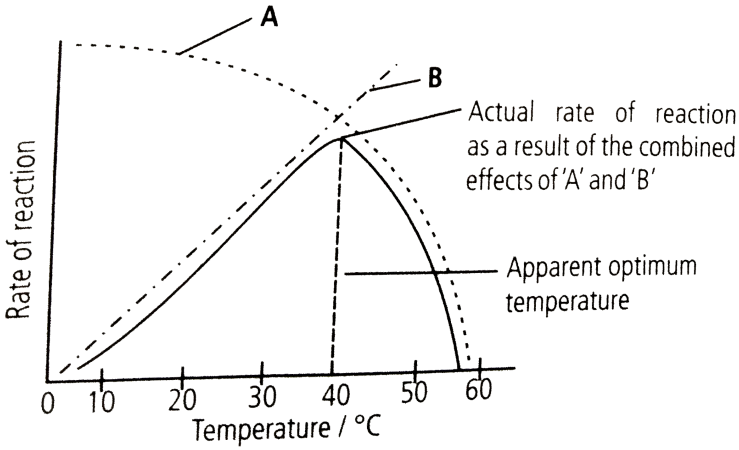
Select the correct statement regarding 'A' and 'B'.

(i) 'A' shows the rate at which reaction decreases due to denaturation of enzyme molecules.

(ii) 'B' shows rate at which reaction increases due to decreased kinetic energy of substrate.

(iii) As temperature rises, more and more enzyme molecules are denatured and 'A' appears to fall.

(iv) 'B' shows rate at which reaction increases due to increased kinetic energy of substrate and enzyme molecules.



A. (i),(iii) and (iv)

B. (iii) only

C. (iii) and (iv) only

D. (i) and (ii) only

Answer: A

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105. Refer to the given graph showing state of ionisation of zwitterion.

Select the correct statements regarding zwitterion.

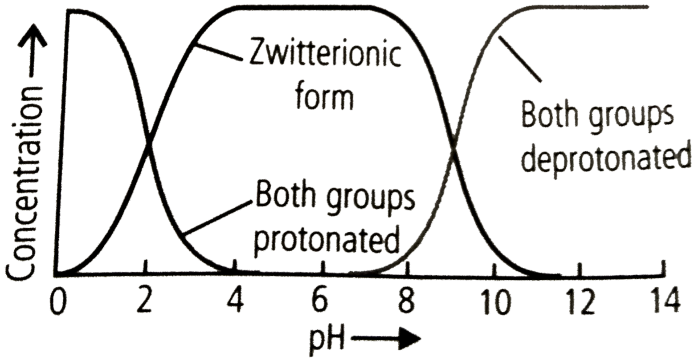
(i) Zwitterions can be formed from compunds that contain both acid groups and basic groups in their molecules.

(ii) A zwitterion can act either as proton donor or proton acceptor.

(iii) A monoamine monocarboxylic α-amino acid is a acid at high pH as both the groups (amino and carboxyl) lose a proton.

(iv) Amino acids in solution at neutral pH exist predominantly as dipolar ions, the amino group is protonated $\left(-NH_3^+ \right)$ and the carboxyl group

is deprotonated $\left(-COO^{-}\right)$.



A. (iii) and (iv)

B. (i), (ii), (iii) and (iv)

C. (i) and (ii)

D. (i), (ii) and (iii)

Answer: B

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106. Study the given data and answer the questions that follow.

A sample of an enzyme called lactase was isolated from the intestinal

lining of a calf. Assays were undertaken to evaluate the activity of the enzyme sample.

The substrate of lactase is the disaccharide lactose. Lactase breaks a lactose molecule in two, producing a glucose molecule and a galactose molecule.

Two assays were carried out.

Lactose concentration (% w/v)	15	15	15	15	15	15
Concentration of enzyme smaple (%v/v)	0	5	10	15	20	25
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	25	50	75	100	125
Lactose concentration (% w/v)	0	5	10	15	25	30
Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	15	25	35	40	40

What are the variables in each of the two assays ?

A. `{:(" ""Assay"1," ""Assay"2),("Lactose concentration", "Conentration of enzyme sample"):}

B.

Assay1	Assay2
Concentration of enzyme sample	Lactose concentration

C.

Assay1	Assay2
Lactose concentration	Lactose concentration

D.

Assay1	Assay2
Conentration of enzyme sample	Conentration of enzyme sample

Answer: B

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Two assays were carried out.

Lactose concentration (% w/v)	15	15	15	15	15	15
Concentration of enzyme smaple (%v/v)	0	5	10	15	20	25
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	25	50	75	100	125
Lactose concentration (% w/v)	0	5	10	15	25	30
Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	15	25	35	40	40

Which of the following statements can be concluded from the two assays ?

A. The reaction rate of the lactase assay is always proportional to the amount of enzyme present.

B. The amount of lactose in an assay has no effect on the rate of the reaction.

C. The reaction rate of the lactase assay is proportional to the amount of lactose present.

D. The reaction rate is proportional to the amount of enzyme present at a lactose concentration of 15%w/v.

Answer: D

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108. Study the given data and answer the questions that follow.

A sample of an enzyme called lactase was isolated from the intestinal lining of a calf. Assays were undertaken to evaluate the activity of the enzyme sample.

The substrate of lactase is the disaccharide lactose. Lactase breaks a lactose molecule in two, producing a glucose molecule and a galactose molecule.

Two assays were carried out.

Lactose concentration (% w/v)	15	15	15	15	15	15
Concentration of enzyme smaple (%v/v)	0	5	10	15	20	25
Reaction rate μmole glucose $sec^{-1} mL^{-1}$	0	25	50	75	100	125
Lactose concentration (% w/v)	0	5	10	15	25	30
Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $sec^{-1} mL^{-1}$	0	15	25	35	40	40

Which of the following assays would you expect to have the highest reaction rate ?

A.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
15	5

B.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
30	5

C.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
15	25

D.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
30	25

Answer: C

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109. It is said that elemental composition of living organisms and that of inanimate objects (like earth's crust) are similar in the sense that all the major elements are present in both. Then what would be the difference between these two groups ?

Choose a correct answer from the following.

A. Living organisms have more gold in them than inanimate objects.

B. Living organisms have more water in their body than inanimate objects.

C. Living organisms have more carbon, oxygen and hydrogen per unit mass than inanimate objects.

D. Living organisms have more calcium in them than inanimate objects.

Answer: C

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110. Many elements are found in living organisms either free or in the form of compounds. One of the following is not found in living organisms.

A. Silicon

B. Magnesium

C. Iron

D. Sodium

Answer: A

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111. Amino acids have both an amino group and a carboxy group in their structure. Which amongst the following is an amino acid ?

A. Formic acid

B. Glycerol

C. Glycolic acid

D. Glycine

Answer: D

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112. An amino acid under certain conditions have both positive and negative charges simultaneously in the same molecule. Such a form of amino acid is called

A. acidic form

B. basic form

C. aromatic form

D. Zwitterion

Answer: D

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113. Which of the following sugars have the same number of carbon as present in glucose ?

A. Fructose

B. Erythrose

C. Ribulose

D. Ribose

Answer: A

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114. An acid soluble compound formed by phosphorylation of nucleoside is called

A. (a) nitrogen base

B. (b) adenine

C. (c) sugar phosphate

D. (d) nucleotide

Answer: D

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115. When we homogenise any tissue in an acid the acid soluble pool represents

A. cytoplasm

B. cell membrane

C. nucleus

D. mitochondria.

Answer: A

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116. The most abundant chemical in living organisms could be

A. protein

B. water

C. sugar

D. nucleic acid.

Answer: B

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117. A homopolymer has only one type of building block called monomer repeated 'n' number of times. A heteropolymer has more than one type of monomer. Proteins are heteropolymers usually made of

A. 20 types of monomer

B. 40 types of monomer

C. 30 types of monomer

D. only one type of monomer.

Answer: A

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118. Proteins perform many physological functions. For example, some proteins function as enzymes. One of the following represents an additional function that some proteins perform

A. antibiotics

B. pigment conferring colour to skin

C. pigment making colurs of flowers

D. hormones

Answer: D

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119. Glycogen is a homopolymer made up of

A. a) glucose units

B. b) galactose units

C. c) ribose units

D. d) amino acids.

Answer: A

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120. The number of 'ends' in a glycogen molecule would be

A. equal to the number of branches plus one

B. equal to the number of branch points

C. one

D. two, one on the left side and another on the right side.

Answer: A

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121. The primary structure of a protein molecule has

A. two ends

B. one end

C. three ends

D. no ends.

Answer: A

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122. Which of the following reactions is not enzyme-mediated in biological system ?

A. Dissolving CO_2 in water

B. Unwinding the two strands of DNA

C. Hydrolysis of sucrose

D. Formation of peptide bond

Answer: A

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123. Assertion : Amino acids are called α-amino acids.

Reason : Amino acids are organic compounds containing an amino group and an acidic group as substituents on the α-carbon.

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124. Assertion : Palmitic acid has 20 carbon atoms including carboxy| carbon.

Reason : Arachidonic acid has 16 carbon atoms including carboxy| carbon.

A. (A) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

B. (B) Both the Assertion and the Reason are correct and the Reason is the incorrect explanation of the Assertion.

C. (C) Assertion is true but the Reason is false.

D. (D) both assertion and reason are false.

Answer: D

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125. Assertion : A protein is a heteropolymer.

Reason : Dietary proteins are the source of non-essential amino acids.

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126. Assertion : The exoskeleton of arthropods is made up of complex polysaccharide called chitin.

Reason : Plant cell walls are made of cellulose.

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127. Assertion : The heterocyclic compounds in nucleic acid are the nitrogenous bases.

Reason : Adenine and guanine are substituted pyrimidines while uracil, cytosine and thymine are substituted purines.

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128. Assertion : The long protein chain is folded upon itself like a hollow ball giving rise to the tertiary structure .

Reason : Tertiary structure gives a 3-dimensional view of a protein.

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129. Assertion : The living state is an equilibrium steady state not be able to perform work.

Reason : Living process is a constant effort to prevent falling into non-equilibrium.

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130. Assertion : All enzymes are not proteins.

Reason : RNA molecules that possess catalytic activity are called ribozymes.

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131. Assertion : Inorganic catalysts work efficiently at high temperature.

Reason : Enzymes get damaged at high temperature.

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132. Assertion : Most of the chemical reactions do not start automatically.

Reason : Reactant molecules have an energy barrier to become reactive.

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133. Assterion : Each enzyme has a substrate binding site in its molecule which forms highly reactive enzyme-substrate complex.

Reason : The enzyme-substrate complex is long-lived and dissociates into its product and unchanged enzyme.

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134. Assertion : The inhibition of activity of succinic dehydrogenase by malonate which closely resembles the substrate succinate in structure is the example of competitive inbhibition.

Reason : Competitive inhibition is the inhibition of enzyme activity when inhibitor closely resembles the substrate, in its molecular structre.

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135. Assertion : Hydrolases are the enzymes which catalyse the hydrolysis of ester, ether, peptide, glycosidic, C-C or P-N etc., bonds.

Reason : Lyases are the enzymes catalysing the linking together of 2 compounds like joining of C-O, C-N, P-O etc. bonds.

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136. Assertion : The protein part of the enzyme is called apoenzyme and non-protein part of the enzyme is called co-factor.

Reason : Zinc is a co-factor for the proteoilytic enzyme carboxypeptidase.

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137. Assertion : Coenzyme nicotinamide adenine dinucleotide (NAD) and NADP contain a vitamin.

Reason : The association of co-enzyme with apoenzyme is enduring .

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Biomolecules

1. The four elements called "big-four" which make up 95% of all elements found in a living system are

A. C,H,O,N

B. C,H,O,P

C. C,H,O,S

D. C,N,O,P.

Answer: A

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2. Read the given statements and select the option that correctly sorts these with respect to A and B in the given flow chart.

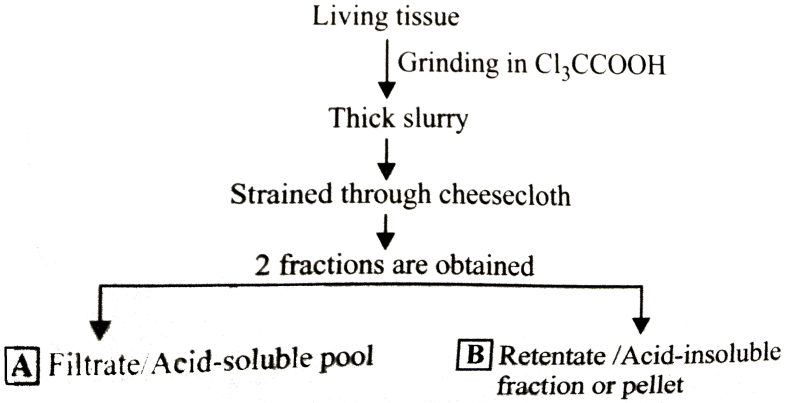
(i) Molecular weight ranging from 18 to 800 daltons (Da) approximately

(ii) Proteins, nucleic acids, polysaccharides and lipids

(iii) Contain chemicals that have molecular weight more than 800 Da

(iv) Has monomers

(v) Generally has polymers



A. A: (i),(ii),(iii) B: (iv),(v)

B. A: (ii),(iv) B: (i),(iii),(v)

C. A: (i),(iv) B: (ii),(iii),(v)

D. A: (i),(iii),(v) B: (ii),(iv)

Answer: C

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3. Take a living tissue, grind it in trichloroacetic acid using pestle and mortar, and then strain it, you would obtain two fractions : acid-soluble and acid-insoluble fraction. Acid-insoluble fraction does not contain

A. polysaccharides

B. nucleic acids

C. lipids

D. flavonoids and alkaloids.

Answer: D

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4. The inorganic compounds like sulphate, phosphate, etc., are found in

A. acid-souluble pool

B. acid-insoluble fraction

C. both (i) and (b)

D. none of these.

Answer: A

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5. The sum total composition of acid-soluble and acid-insoluble fraction represents the entire composition of

A. dead cells

B. gene pool

C. cellular pool

D. gene library.

Answer: C

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6. Biomolecules are

A. inorganic materials

B. organic materials

C. all the carbon compounds obtained from living tissues

D. only DNA and RNA.

Answer: C

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7. Biological molecules are primarily joined by

A. peptide bonds

B. ionic bonds

C. hydrogen bonds

D. covalent bonds.

Answer: D

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8. How many carbon atoms are generally used in composition of monosaccharides ?

A. 3 to 7

B. 1 to 5

C. 5 to 10

D. 5 to 15

Answer: A

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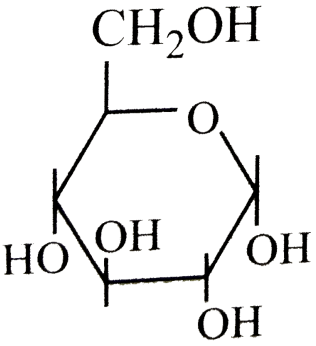
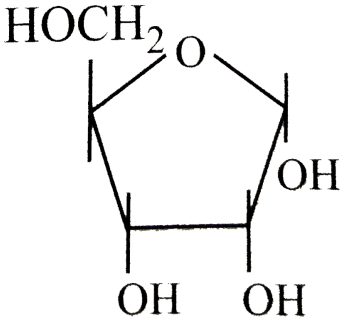
9. Which of the following options correctly identifies the structural formulae shown in figure ?



A



B

A.

A	B
Fructose	Ribose

B.

A	B
Glucose	Deoxyribose

C.

A	B
Glucose	Ribose

D.

A	B
Glucose	Fructose

Answer: C

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10. Match column I with column II and select the correct option from the given codes.

Column I	Column II
$A.$ Tetrose sugar	(i)Galactose
$B.$ Pentose sugar	(ii)Maltose
$C.$ Hexose sugar	(iii)Erythrose
D Disaccharide	(iv)Ribose
	(v)Sedoheptulose

A. $A-(v), B-(iv), C(iii), D-(i),(ii)$

B. $A-(iii), B-(iv), C(v), D-(ii)$

C. $A-(iii), B-(iv), C(i), D-(ii)$

D. $A-(i),(ii), B-(iv), C(iii), D-(v)$

Answer: C

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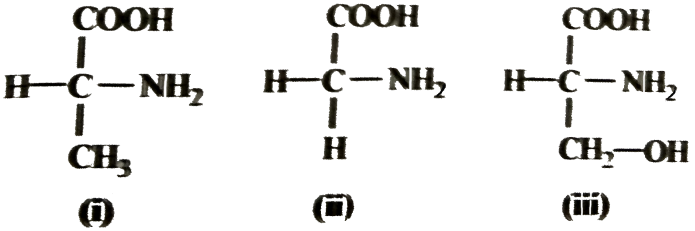
11. Identify the amino acids given below and select the correct option.



	(i)	(ii)	(iii)
A.	Glycine	Serine	Alanine
B.	Alanine	Glycine	Serine
C.	Alanine	Serine	Glycine
D.	Serine	Alanine	Glycine

Answer: B

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12. The 20 different amino acids have different

A. R-groups

B. carboxylic groups

C. peptide bonds

D. amino groups.

Answer: A

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13. Which of the following is the correct match ?

	Acid amino acid	Basic amino acid	Neutral amino acid
A.	Glutamic acid	Lysine	Valine
	Acid amino acid	Basic amino acid	Neutral amino acid
B.	Lysine	Valine	Glutamic acid
	Acid amino acid	Basic amino acid	Neutral amino acid
C.	Glutamic acid	Valine	Lysine
	Acid amino acid	Basic amino acid	Neutral amino acid
D.	Lysine	Glutamic acid	Valine

Answer: A

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14. Acidic amino acids have two-COOH groups and one $-NH_2$ group per molecule. Select the pair that consists of acidic amino acids.

A. Aspartic acid, glutamic acid

B. Lysine, arginine

C. Glycine, alanine

D. Both (a) and (b)

Answer: A

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15. An example of aromatic amino acid is

A. tyrosine

B. phenylalanine

C. trytophan

D. all of these

Answer: D

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16. Essential amino acids include

A. leucine

B. valine

C. tryptophan

D. all of these

Answer: D

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17. Which of the following statements about amino acids is incorrect ?

A. Essential amino acids are not synthesised in the body, therfore have to be provided in the diet.

B. Leucine, isoleucine, lysine, valine are essential amino acids.

C. Cysteine and methionine are sulphur containing amino acids.

D. Lysine and arginine are acidic amino acids.

Answer: D

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18. Saturated fatty acids possess ____bonds between carbon atoms and are _____ at room temperature.

A. singel, solids

B. double, solids

C. single, liquids

D. double, liquids

Answer: A

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19. Which of the following is a saturated fatty acid?

A. Oleic acid

B. Linoleic acid

C. Arachidonic acid

D. Palmitic acid

Answer: D

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20. Triglycerides are fatty acid esters of glycerol, which are formed by the esterification of ___ molecule (s) of fatty acids with ___ molecule(s) of glycerol.

A. one, two

B. one, three

C. three, one

D. two, one

Answer: C

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21. Which of the following is a triglyceride ?

A. Wax

B. Phospholipid

C. Oil

D. Steroid

Answer: C

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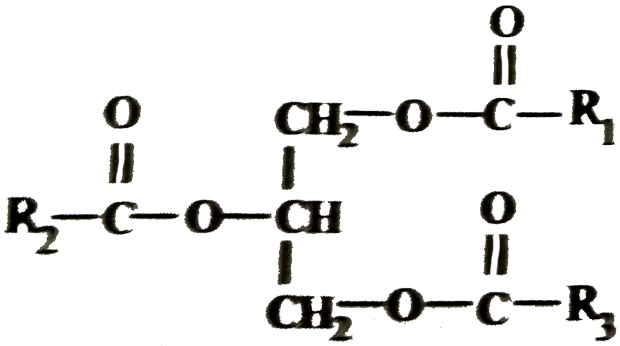
22. Given molecular formula belongs to which of the following groups of biomolecules ?



A. Carbohydrates

B. Proteins

C. Nucleic acids

D. Triglycerides

Answer: D

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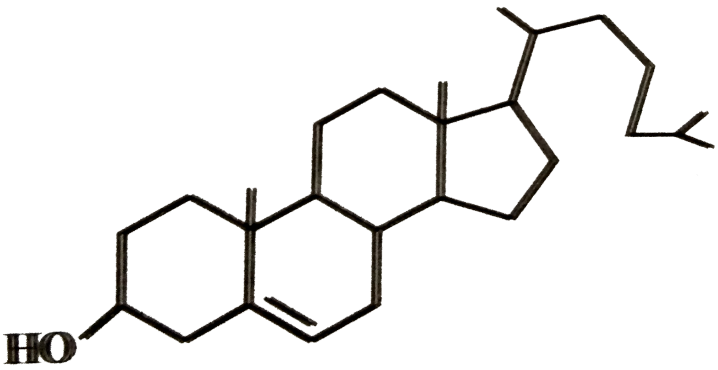
23. Given structural formula is correctly identified along with its related function by which of the following options ?



A. Cholesterol- A component of animal cell membrane

B. Lecithin - A component of cell membrane

C. Triglycide- An energy source

D. Adenosine - A component of nucleic acids

Answer: A

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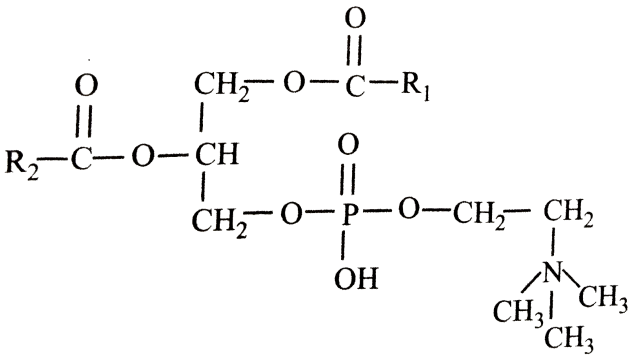
24. Given structural formula is correctly identified along with its related function by which of the following options ?



A. Cholesterol- A component of animal cell membrane

B. Lecithin - A component of cell membrane

C. Triglycide- An energy source

D. Adenosine - A component of nucleic acids

Answer: B

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25. Lecithin is a

A. sterol

B. glycolipid

C. phospholipid

D. sphingolipid.

Answer: C

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26. An unknown liquid collected from a sample of peas, is added to a beaker of water and is vigorously shaken. After few minutes, water and the unknown liquid made two separate layers. To which class of biomolecules, does the unknown liquid most likely belongs ?

A. polysaccharides

B. Proteins

C. lipids

D. Enzymes

Answer: C

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27. The component present in both nucleotides and nucleosides is

A. sugar

B. phosphate

C. nitrogenous base

D. both (a) and (b)

Answer: D

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28. Cytidine is a

A. nitrogenous base

B. nucleoside

C. nucleotide

D. nucleic acid.

Answer: B

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29. Refer to the given reactions.

(i) Adenine $+X \rightarrow$ Adenosine

(ii) Adenosine $+Y \rightarrow$ Adenylic acid

What does X and Y represent here ?

A. $\underset{\text{Phosphate}}{\text{X}} \quad \underset{\text{Sugar molecule}}{\text{Y}}$

B. $\underset{\text{Sugar molecule}}{\text{X}} \quad \underset{\text{Phosphate group}}{\text{Y}}$

C. $\underset{\text{Sugar molecule}}{\text{X}} \quad \underset{\text{Nitrogenous base}}{\text{Y}}$

D. $\underset{\text{Nitrogenous base}}{\text{X}} \quad \underset{\text{Sugar molecule}}{\text{Y}}$

Answer: B

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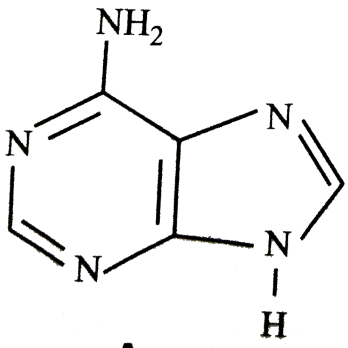
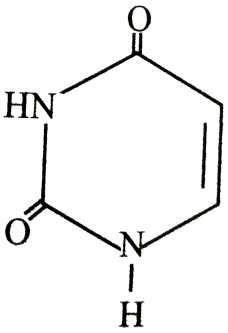
30. Identify the given structural formulae and select the correct option.



A



B

	A	B
A.	Adenine	Uracil
B.	Guanine	Thymine
C.	Adenine	Guanine
D.	Cytosine	Thymine

Answer: A

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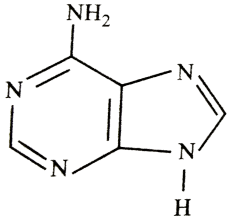
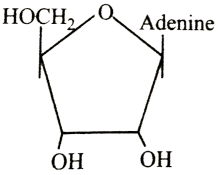
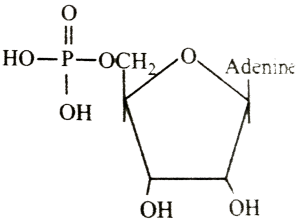
31. The three structural formulae A, B and C are given here. Identify them and select the correct option.



A



B



C

A.

$($ $A,$ $B,$ $C), ((a)$Adenine, Adenosine, Adenylic acid$),$ (

(N-base)","(Nucleotide)","(Nucleoside)"):}`

B.

$($ $A,$ $B,$ $C), ((a)$Adenine, Adenosine, Adenylic acid$),$ (

(N-base)","(Nucleotide)","(Nucleotide)"):}`

C.

$($ $A,$ $B,$ $C), ((a)$Adenosine, Adenylic acid, Adenine$),$ (

(Nucleoside)","(Nucleotide)","(N-basie)"):}`

D.

$(\quad A, \quad B, \quad C), ((a)\text{Adenosine, Adenylic acid, Deoxyadenyli}$

(Nucleoside)","(Nucleotide",):}`

Answer: B

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32. Adenosine, guanosine, thymidine, uridine, cytidine are all ___ but adenylic acid, guanylic acid, uridylic acid, cytidylic acid are _____.

A. nucleotides, nucleosides

B. nucleosides, nucleotides

C. nucleotides, nucleic acids

D. nucleosides, nucleic acid

Answer: B

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33. Match column I with column II and select the correct option from the given codes.

Column I (Category)	Column II (secondary metaboliteis)
A. Pigments	(i)Concanavalin A
B. Terpenoides	(ii)Monoterpenes, diterpenes
C. Alkalods	(iii)Morphine, codeine
D. Lectins	(iv)Carotenoids, anthocyanins

A. $A-(iv), B-(ii), C-(iii), D-(i)$

B. $A-(iv), B-(iii), C-(ii), D-(i)$

C. $A-(iv), B-(i), C-(iii), D-(ii)$

D. $A-(i), B-(iii), C-(ii), D-(iv)$

Answer: A

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34. Which of the following secondary metabolites are used as drugs ?

A. Abrin and ricin

B. Vinblastin and curcumin

C. Anthocyanins

D. Gums and cellulose

Answer: B

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35. Which of the following are alkaloids ?

A. Cellulose

B. Codeine

C. Morphine

D. Both (b) and (c)

Answer: D

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36. Select the incorrect match from the following .

A. Terpenoids - Monoterpenes

B. Lectins - Concanavalin A

C. Toxins - Anthocyanins

D. Drugs - Vinblastin

Answer: C

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37. Study the given statements and select the correct option.

Carbohydrates, proteins, nucleic acids and lipids are primary metabolites.

Alkaloids, floavonoids, rubber, etc., are secondary metabolites.

Linoleic, linolenic and palmitic acids are the three essential fatty acids.

A. Statements (i) and (ii) are correct.

B. Statements (i) and (iii) are incorrect.

C. Statements (i) and (iii) are correct.

D. Only statement (ii) is incorrect.

Answer: A

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38. Match column I with column II and select the correct option from the given codes.

	Column I	Column II
$A.$	Galactose	(i)Protein
$B.$	Anticoagulant	(ii)Phospholipid
$C.$	Fructose	(iii)Brain sugar
$D.$	Lecithin	(iv)Heparin
$E.$	Insulin	(v)Fruit sugar

A. $A-(v), B-(iii), C-(ii), D-(i), E-(iv)$

B. $A-(v), B-(iii), C-(i), D-(iv), E-(ii)$

C. $A-(i), B-(ii), C-(iii), D-(v), E-(iv)$

D. $A-(iii), B-(iv), C-(v), D-(ii), E-(i)$

Answer: D

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39. The correct order of chemical composition of living tissues/cells in term of percentage of the total cellular mass is

A. nucleic acids $>$ proteins $>$ H_2O $>$ carbohydrates $>$ Ions $>$ iipids

B. H_2O $>$ proteins $>$ nucleic acids $>$ carbohydrates $>$ lipids $>$ ions

C. H_2O $>$ proteins $>$ carbohydrates $>$ nucleic acids $>$ Lipids $>$ ions

D. lipids $>$ ions $>$ carbohydrates H_2O $>$ proteins $>$ nucleic acids

Answer: B

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40. Match the column I with column II and choose the correct combination from the options given.

Column I (Component)	Column II (% of the total cellular mass)
A. Ions	$(i)1$
B. Lipids	$(ii)2$
C. Carbohydrates	$(iii)3$
D. Nucleic acids	$(iv)5$-7
E. Proteins	$(v)10$-15

A. $A-(i), B-(ii), C-(iii), D-(iv), E-(v)$

B. $A-(ii), B-(iii), C-(i), D-(v), E-(iv)$

C. $A-(iii), B-(i), C-(ii), D-(iv), E-(v)$

D. $A-(iv), B-(ii), C-(iii), D-(v), E-(i)$

Answer: A

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41. Match column I with column II and select the correct option from the given codes.

Column I	Column II
A. Glut	(i)Intercellular ground substance
B. Antibody	(ii)Enzyme
C. Collagen	(iii)Hormone
D. Trypsin	(iv)Fights infectious agents
E. Insulin	(v)Enables glucose transport in cells

A. $A-(i), B-(ii), C-(iii), D-(iv), E-(v)$

B. $A-(v), B-(iv), C-(i), D-(ii), E-(iii)$

C. $A-(v), B-(iv), C-(iii), D-(ii), E-(i)$

D. $A-(ii), B-(i), C-(iv), D-(v), E-(iii)$

Answer: B

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42. _____ is the most abundant protein in animal world and ____ is the most abundant protein in the whole biosphere.

A. Collagen, RuBisCO

B. Collagen, keratin

C. Keratin, RuBisCO

D. Keratin, collagen

Answer: A

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43. What will be the molecular formula of a polypeptide consisting of 10 glycine when the formula of glycine is `C_(2)H_(5)O_(2)N_ ?

A. $C_6H_{12}ON_5$

B. $C_{20}H_{32}O_{11}N_{10}$

C. $C_{30}H_{16}O_6N_{10}$

D. $C_{25}H_{16}O_6N_5$

Answer: B

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44. Read the given statement and select the option that correctly identifies X and Y.

In a glycogen molecule, successive glucose units are joined together by X and branches are linked together by Y.

A. X: $1,4-\alpha-$ glycosidic bonds Y: $1,4-\alpha-$ glycosidic acid

B. X: $1,4-\alpha-$ glycosidic bonds Y: $1,6-\alpha-$ glycosidic bonds

C. X: $1,6-\alpha-$ glycosidic acid Y: $1,4-\alpha-$ glycosidic acid

D. X: $1,6-\alpha-$ glycosidic acids Y: $1,6-\alpha-$ glycosidic acid

Answer: B

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45. The polysaccharides made up of glucose monomers are

A. sucrose, lactose, maltose

B. chitin, glycogen, starch

C. starch, glycogen, cellulose

D. starch, inulin, peptidoglycan.

Answer: C

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46. Study the given statements and select the correct answer.

(i) Cellulose is a homospolymer of glucose.

(ii) Inulin is a homopolymer of fructose.

(iii) Starch gives blue colour and glycogen gives red colour with iodine solution.

(iv) Cellulose gives no colour with iodine solution.

A. Statements (i), (ii) and (iii) are correct.

B. Statements (i),(ii) and (iv) are correct.

C. Statements (ii) and (iii) are correct.

D. All statements are correct.

Answer: D

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47. Study the given statements and select the correct answer.

(i) Right end of a polysaccharide chain is called reducing end while left end is called non-reducing end.

(ii) Starch can hold cellulose being non-helical, cannot hold iodine.

(iii) Starch and glycogen are branched molecules. (iv) Starch and glycogen are the reserve food materials of plants and animals, respectively.

A. Statements (i) and (ii) are correct.

B. Statements (ii) and (iii) are correct.

C. Only statement (iv) is correct.

D. All statements are correct.

Answer: D

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48. Which of the following is a heteropolymer ?

A. Cellulose

B. Peptidoglycan

C. Starch

D. Glycogen

Answer: B

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49. Which of the following statements is not correct regarding chitin ?

A. It is a storage polysaccharide.

B. It is a homopolysaccharide.

C. It is a constituent of arthropod exoskeleton and fungal cell wall.

D. It is the second most abundant carbohydrate on earth.

Answer: A

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50. Read the given statements.

(i) Fructose is the sweetest sugar.

(ii) Glycine is the simplest amino acid.

(iii) Lactose is a disaccharide composed of one molecule each of glucose and galactose.

(iv) Cellulose is an unbranched chain of glucose molecules linked by

$\beta - 1,4$-glycosidic bond.

Which of the given statements are correct ?

A. (i) and (ii)

B. (iii) and (iv)

C. (i), (ii) and (iii)

D. (i),(ii),(iii) and (iv)

Answer: D

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51. In a DNA molecule, the phosphate group is attached to _____ cabon of the sugar residue of its own nucleotide and ____ carbon of the sugar residue of the next nucleotide by _____ bonds.

A. 5', 3', phosphodiester

B. 5',3', glycosidic

C. 3',5', phosphodiester

D. 3', 5', glycosidic

Answer: A

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52. Purines have nitrogen atoms at _____ positions.

A. 1', 3', 7', 9'

B. 1', 5', 7', 9'

C. 1', 3'

D. 1', 9'

Answer: A

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53. Pyrimidines have nitrogen atoms at _____ positions.

A. 1', 3', 7', 9'

B. 1', 5', 7', 9'

C. 1', 3'

D. 1', 9'

Answer: C

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54. B-DNA which is right -handed double helix contains _____ base pairs per turn of the helix and each tum is ____ long .

A. 10, 3.4 Å

B. 10, 34 Å

C. 11, 20 Å

D. 11, 34 Å

Answer: B

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55. Which of the following is an incorrect match ?

A. Purines - Adenine, guanine

B. Pyrimidines - Cytosine, thymine

C. Structural polysaccharides - Inulin

D. Storage polysaccharides - Starch

Answer: C

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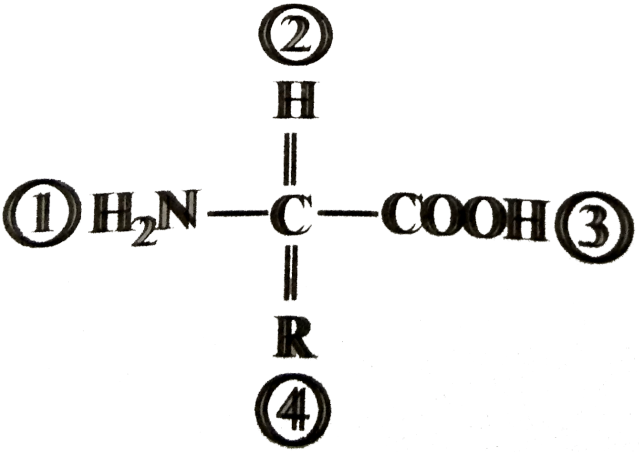
56. Which of the two groups of the given formula is involved in peptide bond formation between different amino acids ?



A. 2 and 3

B. 1 and 3

C. 1 and 4

D. 2 and 4

Answer: B

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57. Primary structure of proteins is due to the presence of

A. peptide bonds

B. disulphide (S-S) linkages

C. hydrogen bonds

D. ionic bonds

Answer: A

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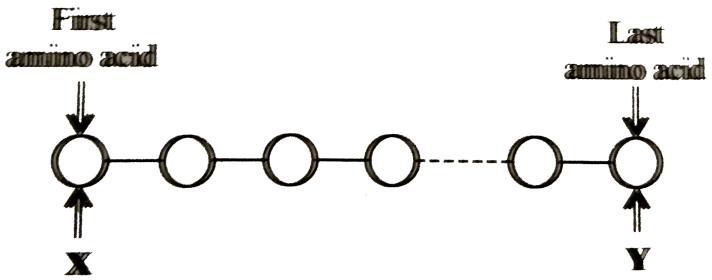
58. Identify X and Y in the given sequence.



A. N- terminal amino acid C- terminal amino acid

B. N- terminal amino acid N- terminal amino acid

C. C- terminal amino acid N- terminal amino acid

D. C- terminal amino acid C- terminal amino acid

Answer: A

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59. At some points a protein molecule may be folded back on itself. This called ____ structure and folds or coils are held together in place by _____.

A. 2°, H-bonds

B. 2°, peptide bonds

C. 3°, H-bonds

D. 1°, peptide bonds

Answer: A

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60. An α- helix is the example of which type of protein structure ?

A. Primary

B. Secondary

C. Tertiary

D. Quatemary

Answer: B

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61. A β-pleated sheet organisation in a polypeptide chain is an example of

A. 1° structure

B. 2° structure

C. 3° structure

D. 4° structure.

Answer: B

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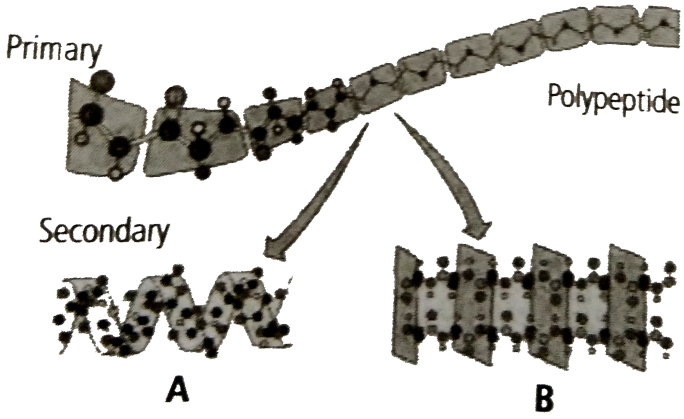
62. Refer to the given figure.

Formation of structures A and B could be due to



A.

A	B
Formation of peptide bonds	Linking together of two or more polyp

B.

A	B
Formation of hydrogen bonds	Linking together of two or more pol

C.

A	B
Formation of hydrogen bonds	Formation of hydrogen bonds

D.

A	B
Formation of peptide bonds	Formation of peptide bonds

Answer: B

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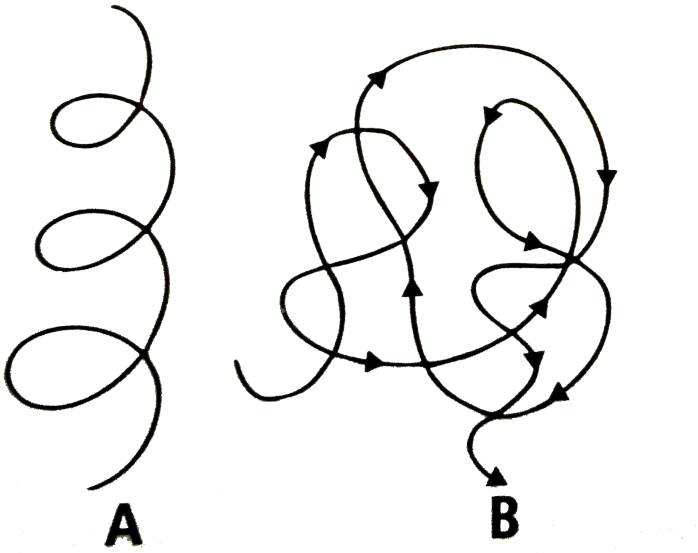
63. Recognise the figure and find out the correct matching.



A. A- Primary structure, B-Secondary structure

B. A-Secondary structure, B- Primary structure

C. A-Secondary structure, B- Tetiary structure

D. A-Tertiary structure, B-Quaternary structure

Answer: C

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64. Adult human haemolgobin consists of

A. 2 subunits (α, α)

B. 2 subunits (β, β)

C. 4 subunits $(2\alpha, 2\beta)$

D. 3 subunits $(2\alpha, 1\beta)$

Answer: C

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65. Read the given statements and select the correct option.

Statement 1 : Hemoglobin is an example of quatenary structure of proteins.

Statement 2 : Hemoglobin molecule is composed of four polypeptide chains-twoα-chains and two β-chains.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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66. Keratin present in hair shows secondary structure known as

A. parallel β-sheet

B. antiparallel β-sheet

C. α-helix

D. none of these.

Answer: C

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67. Select the option that correctly identifies the chemical bonds present in the given biomolecules.

Polysaccharides-A, Proteins-B, Fats-C, Water -D

A. $\begin{matrix} A & B & C & D \\ \text{Ester} & \text{Peptide} & \text{Glycosidic} & \text{Hydrogen} \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{Glycosidic} & \text{Peptide} & \text{Ester} & \text{Hydrogen} \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{Glycosidic} & \text{Peptide} & \text{Hydrogen} & \text{Ester} \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{Hydrogen} & \text{Ester} & \text{Peptide} & \text{Glycosidic} \end{matrix}$

Answer: B

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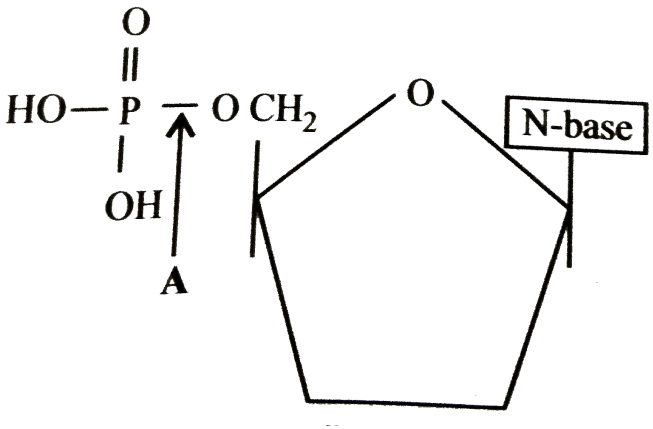
68. What does A represent in the given diagram of a nucleotide ?



A. Glycosidic bond

B. Phosphate bond

C. Ester bond

D. Ionic bond

Answer: C

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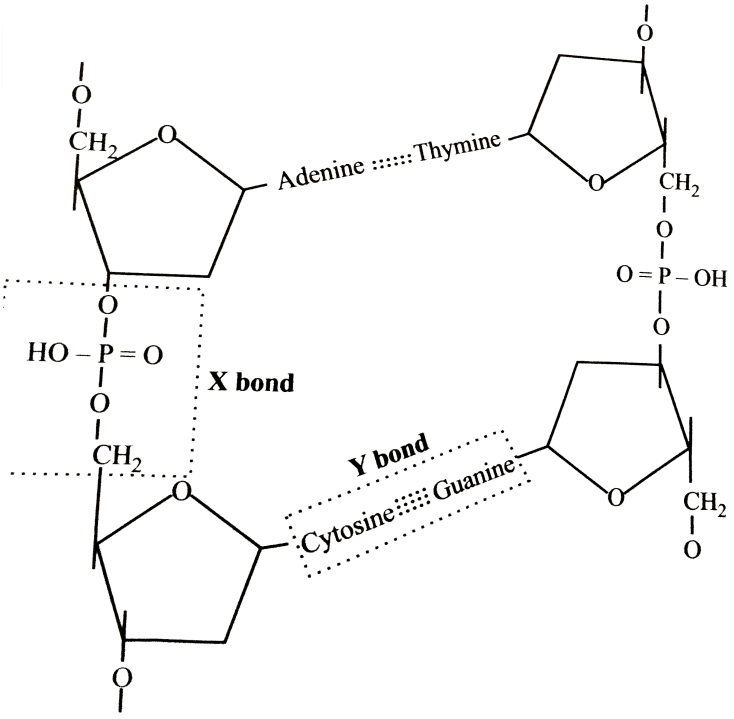
69. Which bonds are indicated by X and Y in the given diagram ?



A. X Glycosidic bond Y Hydrogen bond

B. X Phosphodiester bond Y Hydrogen bond

C. X Glycosidic bond Y Phosphodiester bond

D. X Phosphodiester bond Y Glycosidic bond

Answer: B

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70. Read the following statements and select the correct option.

Statement 1 : All biomolecules have a turn over.

Statement 2 : One type of biomolecule changes into some other type of biomolecule.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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71. The regulation by an organism of chemical composition of its blood and body fluids and other aspects of its internal environment so that physiological processes can proceed at optimum rates is called

A. metabolism

B. enthalpy

C. entropy

D. homeostasis.

Answer: D

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72. The proteins which hasten the rate of a given metabolic conversation are called

A. haemoglobins

B. metabolites

C. enzymes

D. none of these.

Answer: C

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73. In an enzyme, active sites/pockets/crevies are present on

A. 1° structure

B. 2° structure

C. 3° structure

D. all of these

Answer: C

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74. Enzymes catalyse the biochemical reactions by ___ the activation energy.

A. lowering

B. increasing

C. unaltering

D. either (a) or (b)

Answer: A

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75. Read the given statements and select the correct option.

Statement 1 : Low temperature destroys enzymes by causing their denaturation.

Statement 2 : High temperature preserves the enzymes in their inactive state.

A. Both statements 1 and 2 are correct.

B. Statements 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: D

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76. Read the lgiven statements and select the correct option .

Statement 1 : Ribozymes are RNA molecules which catalyse the synthesis of certain specific RNAs and removal of introns from mRNA.

Statement 2 : Ribozymes are proteinaceous enzymes.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: B

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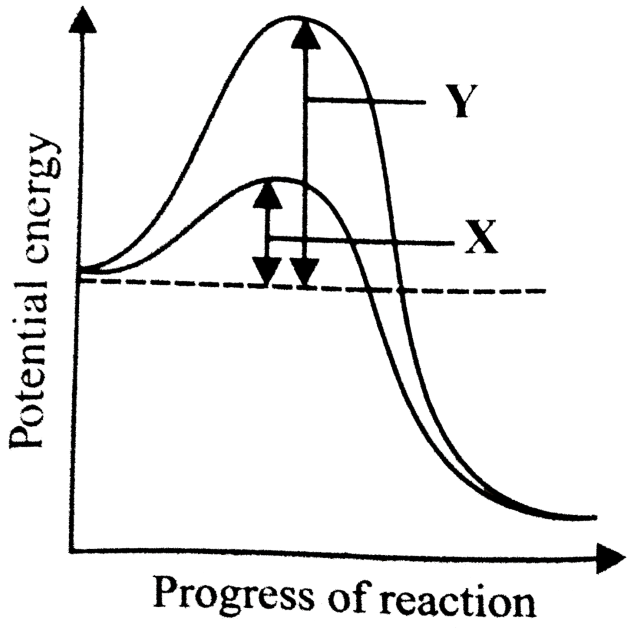
77. What is denoted by and Y in the given graph ?



A.

X Y

Activation energy without enzyme Activation energy with enzym

B.

X Y

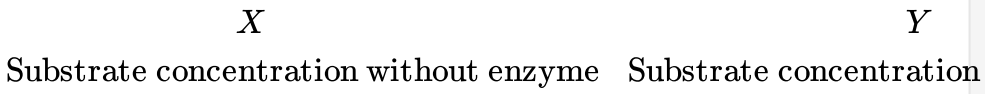
Activation energy with enzyme Activation energy without enzym

C.

X Y

Substrate concentration with enzyme Substrate concentration wit

D.



Answer: B

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78. Which of the following statements is incorrect regarding enzymatic activity ?

A. It increases with increase in substrate concentration upto to the saturation point.

B. It is highest at optimum pH value.

C. It initially decreases with increase in pH value.

D. It initially increases with increase in temperature and then decreases

Answer: C

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79. Which of the following statements about enzymes are correct ?

(i) Enzymes do not alter the overall change in free energy for a reaction.

(ii) Enzymes are proteins whose three dimensional energy.

(iii) Enzymes speed up reactions by lowering activation energy.

(iv) Enzymes are highly specific for reactions.

(v) The energy input needed to start a chemical reaction is called activation energy.

A. (i) and (v)

B. (ii) and (iv)

C. (i),(ii) and (iv)

D. All of these

Answer: D

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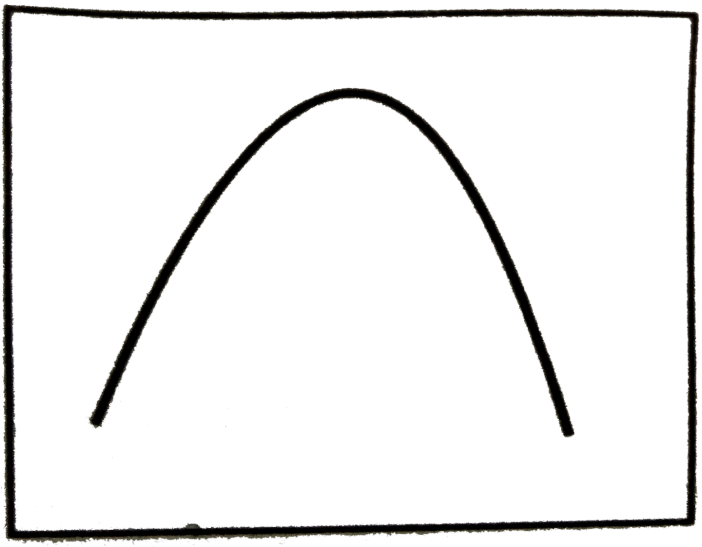
80. Select the right option regarding the given graph.



A. $X-$ axis Rate of reaction $Y-$ axis Enzymatic activity

B. $X-$ axis Enzymatic activity $Y-$ axis Rate of reaction

C. $X-$ axis Enzymatic activity $Y-$ axis $\mathrm{pH}/\mathrm{Temperature}$

D. $X-$ axis $\mathrm{pH}/\mathrm{Temperature}$ $Y-$ axis Enzymatic activity

Answer: C

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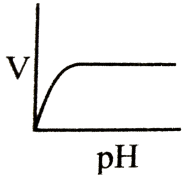
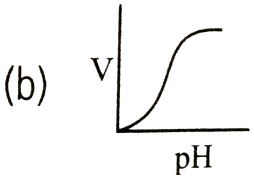
81. Which one of the given graphs shows the effect of pH on the velocity of a typical enzymatic reaction (V) ?

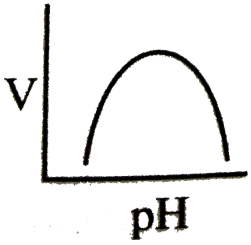
A.



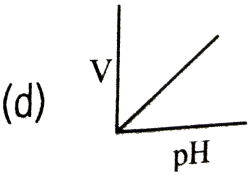
B.



C.



D.



Answer: C

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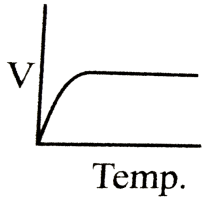
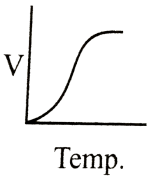
82. Which one of the given graphs shows the effect of temperature on the velocity of a typical enzymatic reaction ?

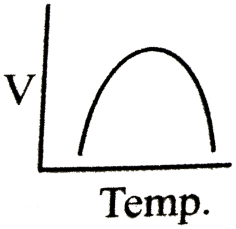


A.

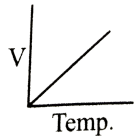
(b)



B.



C.

(d) 

D.

Answer: C

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83. Enzymes are most functional within the temperature range of

A. $15 - 25^{\circ} C$

B. $20 - 30^{\circ} C$

C. $30^{\circ} - 50^{\circ} C$

D. $50 - 60^{\circ} C$

Answer: C

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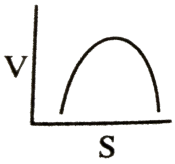
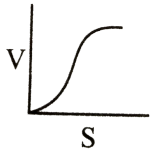
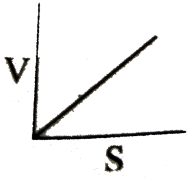
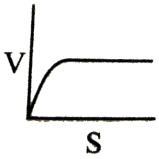
84. Which of the following graphs shows the relationship between the rate of an enzymatic activity and substrate concentration (S) ?

A. a) 

B. (b) 

C. c) 

D. (d) 

Answer: D

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85. Michaelis Menten Constant (K_m) is equal to

A. the rate of reaction

B. the rate of enzymatic activity

C. substrate concentration at which the reaction attains half of its maximum velocity

D. substrate concentration at which the rate of reaction is maximum.

Answer: C

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86. The inhibitor which closely resembles the substrate in its molecular structure and inhibits the enzyme activity by biniding to the active site of the enzyme is called

A. feedback inhibitor

B. non-competitive inhibitor

C. competitive inhibitor

D. allosteric modulator.

Answer: C

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87. inhibition of succinate dehydrogenase by malonate is an example of

A. non-competitive inhibition

B. competitive inhibition

C. allosteric inhibition

D. negative feedback.

Answer: B

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88. The inhibitor which does not resemble the substrate in structure and binds to the enzyme at site other than the active site is called

A. competitive inhibitor

B. non-competitive inhibitor

C. activator

D. substrate analogue.

Answer: B

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89. Feedback inhibition of an enzyme is influenced by

A. enzyme itself

B. external factors

C. end product

D. substrate.

Answer: C

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90. Refer to the given reactin.

$$\underset{\text{Maltose}}{C_{12}H_{22}O_{11}} + H_2O \xrightarrow{Enzyme\,A} \underset{\text{Glucose}}{2C_6H_{12}O_6}$$

Enzyme A used in the reaction, belongs to which class of enzymes ?

A. Dehydrogenases

B. Transferases

C. Hydrolases

D. Lyases

Answer: C

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91. Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis, and addition of groups to double bonds, are called

A. ligases

B. lyases

C. hydrolases

D. dehydrogenases.

Answer: B

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92. Dihydroxyacetone-3 phosphate and glyceraldehyde-3-phosphate are interconvertible. The enzyme responsible for this interconversion belongs to the cateogry of

A. isomerases

B. ligases

C. lyases

D. hydrolases.

Answer: A

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93. Which of the following is an example of isozyme ?

A. α-amylase

B. Glucokinase

C. Lactate dehydrogenases

D. All of these

Answer: D

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94. Holoenzyme is the complete enzyme consisting of an apoenzyme and a co-factor. Select the option that correctly identifies the nature of apoenzyme and co-factor.

A. Apoenzyme Co-factor
Protein Non-protein

B. Apoenzyme Co-factor
Non-protein Protein

C. Apoenzyme Co-factor
Protein Protein

D. Apoenzyme Co-factor
Non-protein Non-protein

Answer: A

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95. The proteinaceous molecule that joins a non-protein prosthetic group to form a functional enzyme, is called

A. apoenzyme

B. co-factor

C. holoenzyme

D. isoenzyme.

Answer: A

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96. Read the given paragraph with few blanks.

Prosthetic groups are $\underline{(i)}$ compunds distinguished from other co-factors in being $\underline{(ii)}$ bound to the apoenzyme. For example, in peroxidase and $\underline{(iii)}$ which catalyse the breakdown of hydrogen peroxide to water and $\underline{(iv)}$, $\underline{(v)}$ is the prosthetic group.

Select the option that correctly fills blanks in the above paragraph.

A.

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
organic	tightly	catalase	oxygen	haem

B.

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
inorganic	loosely	catalase	hydrogen	haem

C.

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
inorganic	tightly	isomerase	hydrogen	haem

D.

$column - i$	$column - ii$	$column - iii$	$column - iv$	$column -$
organic	loosely	isomerase	oxygen	haem

Answer: A

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97. Co-enzyme nicotinamide adenine dinucleotide (NAD) contains vitamin

A. thiamine

B. niacin

C. riboflavin

D. none of these.

Answer: B

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98. Zinc is a co-factor for proteolytic enzyme _____.

A. carboxypeptidase

B. isocitrate

C. fumarase

D. all of these

Answer: A

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99. Select the incorrect statement from the following.

A. Prosthetic groups are inorganic compounds which tightly bind with the apoenzyme.

B. Coenzymes are organic compounds but their association with apoenzyme is only transient.

C. Coenzymes serve as co-factors in number of enzyme catalysed reactions.

D. All of these

Answer: A

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100. Read the given statements and select the correct option.

Statement 1 : Co-factors play a crucial role in the catalytic activity of the enzyme.

Statement 2: Catalytic activity is lost when co-factor is removed from the enzyme.

A. Both statements 1 and 2 are correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statements 1 and 2 are incorrect.

Answer: A

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101. Biochemical reagents are widely used for detection of biomolecules. A reagent that specifically detects a carbonyl group (C=0) in a biomolecule will yield a positive test with

A. protein

B. fatty aicd

C. carbohydrate

D. all of these

Answer: B

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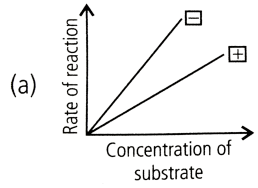
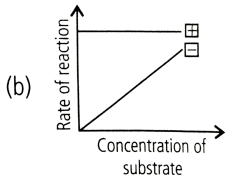
102. Which of the following graphs correctly indicates the reaction in presence (indicated bt +) and absence (indicated as -) of an enzyme ?

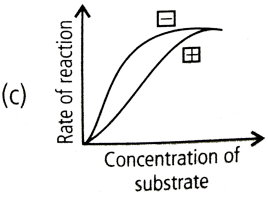
A.



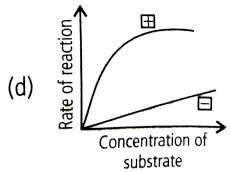
B.



C.



D.



Answer: D

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103. Which of the following graphs correctly indicates the reaction in presence (indicated bt +) and absence (indicated as -) of an enzyme ?

A. P,Q,R and S represent the same reaction carried out in the presence of enzyme, and low temperature, respectively.

B. Q and S represent the same reaction carried out at high and low temperatures, respoectively.

C. R and S represent the same reaction carried out in the presence and absence of catlyst, respectively.

D. P and R represent the same reaction carried out in the absence and presence of enzyme, respectively.

Answer: D

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104. Refer to the given graph showing relationship between temperature and enzyme action.

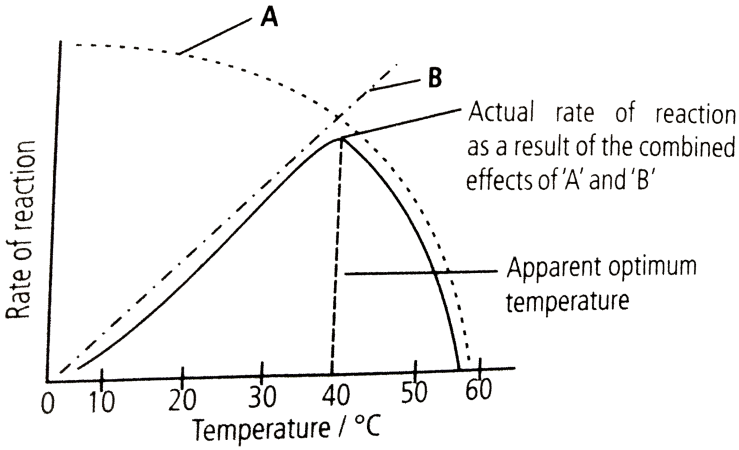
Select the correct statement regarding 'A' and 'B'.

(i) 'A' shows the rate at which reaction decreases due to denaturation of enzyme molecules.

(ii) 'B' shows rate at which reaction increases due to decreased kinetic energy of substrate.

(iii) As temperature rises, more and more enzyme molecules are denatured and 'A' appears to fall.

(iv) 'B' shows rate at which reaction increases due to increased kinetic energy of substrate and enzyme molecules.



A. (i),(iii) and (iv)

B. (iii) only

C. (iii) and (iv) only

D. (i) and (ii) only

Answer: A

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105. Refer to the given graph showing state of ionisation of zwitterion.

Select the correct statements regarding zwitterion.

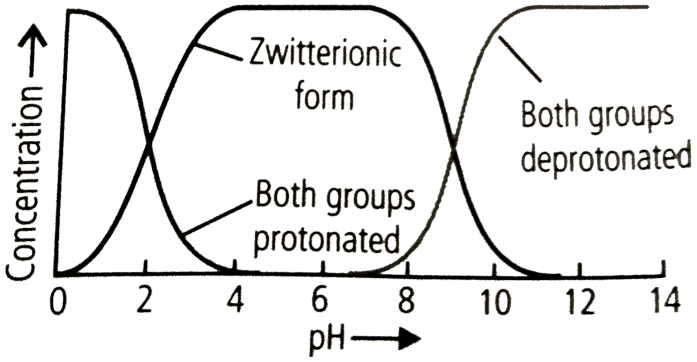
(i) Zwitterions can be formed from compunds that contain both acid groups and basic groups in their molecules.

(ii) A zwitterion can act either as proton donor or proton acceptor.

(iii) A monoamine monocarboxylic α-amino acid is a acid at high pH as both the groups (amino and carboxyl) lose a proton.

(iv) Amino acids in solution at neutral pH exist predominantly as dipolar ions, the amino group is protonated $\left(-NH_3^+ \right)$ and the carboxyl group

is deprotonated $\left(-COO^{-} \right)$.



A. (iii) and (iv)

B. (i), (ii), (iii) and (iv)

C. (i) and (ii)

D. (i), (ii) and (iii)

Answer: B

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106. Study the given data and answer the questions that follow.

A sample of an enzyme called lactase was isolated from the intestinal

lining of a calf. Assays were undertaken to evaluate the activity of the enzyme sample.

The substrate of lactase is the disaccharide lactose. Lactase breaks a lactose molecule in two, producing a glucose molecule and a galactose molecule.

Two assays were carried out.

Lactose concentration (% w/v)	15	15	15	15	15	15
Concentration of enzyme smaple (%v/v)	0	5	10	15	20	25
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	25	50	75	100	125
Lactose concentration (% w/v)	0	5	10	15	25	30
Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	15	25	35	40	40

What are the variables in each of the two assays ?

A. `{:(" ""Assay"1," ""Assay"2),("Lactose concentration", "Conentration of enzyme sample"):}

B.

Assay1	Assay2
Concentration of enzyme sample	Lactose concentration

C.

Assay1	Assay2
Lactose concentration	Lactose concentration

D.

Assay1	Assay2
Conentration of enzyme sample	Conentration of enzyme sample

Answer: B

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107. Study the given data and answer the questions that follow.

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Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $\sec^{-1} mL^{-1}$	0	15	25	35	40	40

Which of the following statements can be concluded from the two assays ?

A. The reaction rate of the lactase assay is always proportional to the amount of enzyme present.

B. The amount of lactose in an assay has no effect on the rate of the reaction.

C. The reaction rate of the lactase assay is proportional to the amount of lactose present.

D. The reaction rate is proportional to the amount of enzyme present at a lactose concentration of 15%w/v.

Answer: D

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108. Study the given data and answer the questions that follow.

A sample of an enzyme called lactase was isolated from the intestinal lining of a calf. Assays were undertaken to evaluate the activity of the enzyme sample.

The substrate of lactase is the disaccharide lactose. Lactase breaks a lactose molecule in two, producing a glucose molecule and a galactose molecule.

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Lactose concentration (% w/v)	0	5	10	15	25	30
Concentration of enzyme smaple (%v/v)	5	5	5	5	5	5
Reaction rate μmole glucose $sec^{-1} mL^{-1}$	0	15	25	35	40	40

Which of the following assays would you expect to have the highest reaction rate ?

A.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
15	5

B.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
30	5

C.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
15	25

D.

Lactose concentration (%w/v)	Concentration of enzyme sample (%
30	25

Answer: C

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109. It is said that elemental composition of living organisms and that of inanimate objects (like earth's crust) are similar in the sense that all the major elements are present in both. Then what would be the difference between these two groups ?

Choose a correct answer from the following.

A. Living organisms have more gold in them than inanimate objects.

B. Living organisms have more water in their body than inanimate objects.

C. Living organisms have more carbon, oxygen and hydrogen per unit mass than inanimate objects.

D. Living organisms have more calcium in them than inanimate objects.

Answer: C

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110. Many elements are found in living organisms either free or in the form of compounds. One of the following is not found in living organisms.

A. Silicon

B. Magnesium

C. Iron

D. Sodium

Answer: A

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111. Amino acids have both an amino group and a carboxy group in their structure. Which amongst the following is an amino acid ?

A. Formic acid

B. Glycerol

C. Glycolic acid

D. Glycine

Answer: D

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112. An amino acid under certain conditions have both positive and negative charges simultaneously in the same molecule. Such a form of amino acid is called

A. acidic form

B. basic form

C. aromatic form

D. Zwitterion

Answer: D

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113. Which of the following sugars have the same number of carbon as present in glucose ?

A. Fructose

B. Erythrose

C. Ribulose

D. Ribose

Answer: A

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114. An acid soluble compound formed by phosphorylation of nucleoside is called

A. nitrogen base

B. adenine

C. sugar phosphate

D. nucleotide.

Answer: D

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115. When we homogenise any tissue in an acid the acid soluble pool represents

A. cytoplasm

B. cell membrane

C. nucleus

D. mitochondria.

Answer: A

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116. The most abundant chemical in living organisms could be

A. protein

B. water

C. sugar

D. nucleic acid.

Answer: B

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117. A homopolymer has only one type of building block called monomer repeated 'n' number of times. A heteropolymer has more than one type of monomer. Proteins are heteropolymers usually made of

A. 20 types of monomer

B. 40 types of monomer

C. 30 types of monomer

D. only one type of monomer.

Answer: A

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118. Proteins perform many physological functions. For example, some proteins function as enzymes. One of the following represents an additional function that some proteins perform

A. antibiotics

B. pigment conferring colour to skin

C. pigment making colurs of flowers

D. hormones

Answer: D

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119. Glycogen is a homopolymer made up of

A. glucose units

B. galactose units

C. ribose units

D. amino acids.

Answer: A

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120. The number of 'ends' in a glycogen molecule would be

A. equal to the number of branches plus one

B. equal to the number of branch points

C. one

D. two, one on the left side and another on the right side.

Answer: A

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121. The primary structure of a protein molecule has

A. two ends

B. one end

C. three ends

D. no ends.

Answer: A

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122. Which of the following reactions is not enzyme-mediated in biological system ?

A. Dissolving CO_2 in water

B. Unwinding the two strands of DNA

C. Hydrolysis of sucrose

D. Formation of peptide bond

Answer: A

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123. Assertion : Amino acids are called α-amino acids.

Reason : Amino acids are organic compounds containing an amino group and an acidic group as substituents on the α-carbon.

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124. Assertion : Palmitic acid has 20 carbon atoms including carboxy| carbon.

Reason : Arachidonic acid has 16 carbon atoms including carboxy| carbon.

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125. Assertion : A protein is a heteropolymer.

Reason : Dietary proteins are the source of non-essential amino acids.

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126. Assertion : The exoskeleton of arthropods is made up of complex polysaccharide called chitin.

Reason : Plant cell walls are made of cellulose.

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127. Assertion : The heterocyclic compounds in nucleic acid are the nitrogenous bases.

Reason : Adenine and guanine are substituted pyrimidines while uracil, cytosine and thymine are substituted purines.

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128. Assertion : The long protein chain is folded upon itself like a hollow ball giving rise to the tertiary structure .

Reason : Tertiary structure gives a 3-dimensional view of a protein.

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129. Assertion : The living state is an equilibrium steady state not be able to perform work.

Reason : Living process is a constant effort to prevent falling into non-equilibrium.

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130. Assertion : All enzymes are not proteins.

Reason : RNA molecules that possess catalytic activity are called ribozymes.

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131. Assertion : Inorganic catalysts work efficiently at high temperature.

Reason : Enzymes get damaged at high temperature.

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132. Assertion : Most of the chemical reactions do not start automatically.

Reason : Reactant molecules have an energy barrier to become reactive.

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133. Assterion : Each enzyme has a substrate binding site in its molecule which forms highly reactive enzyme-substrate complex.

Reason : The enzyme-substrate complex is long-lived and dissociates into its product and unchanged enzyme.

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134. Assertion : The inhibition of activity of succinic dehydrogenase by malonate which closely resembles the substrate succinate in structure is the example of competitive inbhibition.

Reason : Competitive inhibition is the inhibition of enzyme activity when inhibitor closely resembles the substrate, in its molecular structre.

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135. Assertion : Hydrolases are the enzymes which catalyse the hydrolysis of ester, ether, peptide, glycosidic, C-C or P-N etc., bonds.

Reason : Lyases are the enzymes catalysing the linking together of 2 compounds like joining of C-O, C-N, P-O etc. bonds.

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136. Assertion : The protein part of the enzyme is called apoenzyme and non-protein part of the enzyme is called co-factor.

Reason : Zinc is a co-factor for the proteoilytic enzyme carboxypeptidase.

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137. Assertion : Coenzyme nicotinamide adenine dinucleotide (NAD) and NADP contain a vitamin.

Reason : The association of co-enzyme with apoenzyme is enduring .

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