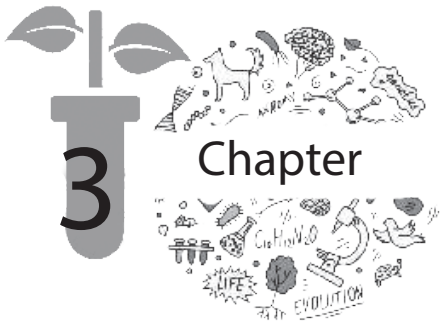


Chapter 3

Biomolecules

MULTIPLE CHOICE QUESTIONS

1. Elemental analysis on a plant tissue, animal tissue or a microbial paste reveals:
(a) List of elements like C; H; O & several others
(b) Respective content per unit mass of a living tissue
(c) Both (a) and (b)
(d) Diversity of living organism in our Biosphere.

2. Elemental list could be _____ in _____ terms of study on living tissues & earth's crust:-
(a) same; absolute
(b) different; absolute
(c) different; same
(d) same; relative

Topic 1	How to Analyse Chemical Composition?

3. Palmitic acid has _____ number of carbons including carboxyl carbon.
(a) 16 (b) 15
(c) 14 (d) 12

4. Arachidonic acid has _____ number of carbon atoms including the carboxyl
(a) 16 (b) 20
(c) 21 (d) 19

5. Fatty acids could be _____ (with double bonds) or _____ (without double bonds).
(a) Saturated; Unsaturated
(b) Unsaturated; Saturated
(c) Saturated; Saturated
(d) Unsaturated; Unsaturated

6. How many of the following is an esterified glycerol?
Monoglyceride;
Diglyceride;
Triglyceride:
Muramic acid
Lignin;
Suberin
(a) 4 (b) 5
(c) 6 (d) 3

7. The oil which have lower melting point:
(a) All fats (b) triglycerides
(c) Gingelly oil (d) All

8. A phospholipid have
(a) a phosphorous
(b) a phosphorylated group
(c) both (a) and (b)
(d) none

9. The neural tissues have lipids with _____ structure
(a) more complex (b) less complex
(c) more simple (d) simple

10. Carbon compounds in living organism having heterocyclic rings could be
(a) Monoglyceride (b) Adenine
(c) Cytosine (d) Both (b) & (c)

11. Adenine esterified with sugar is known as
(a) Adenylic acid (b) Adenosine
(c) Adenotine (d) None of the above

12. Nucleic acids like DNA & RNA consist of
(a) Nucleotide & nucleoside
(b) Nucleoside only
(c) Nucleotide only
(d) Nucleotide & phosphate groups.

13. With respect to other elements which element is relatively abundant in living organism than in earth's crust?
(a) C & Ca (b) C & H
(c) S & N (d) N & Ca

14. For the chemical composition analysis,____ is used.
(a) Ch_3COOH (b) CH_3COOH-Cl
(c) Cl_3-CCOOH (d) Cl_3- COOH

15. Filtrate obtained after grinding of living tissue is also known as:
(a) Slurry
(b) Acid - soluble
(c) Acid insoluble pool
(d) All

16. Acid – insoluble pool is also known as:
(a) Slurry (b) Retentate
(c) Filtrate (d) All

17. Analytical techniques applied to the compound gives us an idea of:-
(a) Probable structure of compounds
(b) Molecular formula of compounds.
(c) Both (a) and (b)
(d) None

18. All the carbon compounds that we get from the living tissue can be called:-
(a) Biomolecules (b) Slurry
(c) Retentate (d) All

19. If the tissue is fully burnt:-
(a) All the carbon compounds are oxidised to gaseous forms (CO_2 & water vapour).
(b) Remaining are known as ash.
(c) Ash contains inorganic elements & inorganic compounds.
(d) All

20. Inorganic elements like sulphate and phosphates are present in-
(a) Ash of burnt tissue
(b) Oxidised gaseous form
(c) Both (a) and (b)
(d) None

21. α – Amino acids are organic compounds containing
(a) Amino group and acidic group substituted on different carbon.
(b) Keto – group & Hydrogen on different carbon.
(c) Amino group & acidic group substituted on same carbon.
(d) Keto – group & alcohol group substituted on same carbon.

22. How many substituted groups are present in an α – amino acid?
(a) 1 (b) 2
(c) 3 (d) 4

23. The R – group in a proteinaceous amino acid could be:
(a) Hydrogen (b) Methyl group
(c) Hydroxy methyl (d) Any of the above

24. The chemical and physical properties of amino acids are essentially of the
(a) amino group (b) carboxyl group
(c) the R - group (d) all of the above

25. If the R – group of amino acid is methyl
(a) Glycine (b) Serine
(c) Alanine (d) Any of the above

26. A hydrogen substituted carbon containing amino acid is:-
(a) Glycine (b) Alanine
(c) Both (a) & (b) (d) Serine

27. Number of Amino; Carboxyl & the R – functional group determines:-
(a) Acidic nature of Amino acid.
(b) Basic nature of Amino acid

(c) Neutral nature of Amino acid
(d) Any of the above

28. Which of the following group of amino acid is aromatic in nature?
(a) Tyrosine; phenylalanine
(b) Tyrosine; tryptophan, glutamic acid
(c) Glutamic acid; lysine; valine
(d) None of the above

29. Which of the following is neutral in nature?
(a) Valine (b) Serine
(c) Alanine (d) All

30. A particular property of amino acid is the ionizable nature of:
(a) -H (b) $-NH_2$
(c) CH_3 (d) All

31. Which of the following determines the particular property of amino acid is the Ionizable nature & structure of amino acid:-
(a) $-NH_2$ & –COOH
(b) –COOH only
(c) $-NH_2$ only
(d) none of the above

32. In different solution; of different ____ the of _____ amino acid changes.
(a) pH; pH
(b) pH; structure
(c) structure; structure
(d) structure; pH

33. Which of the following is a zwitterionic form?
(A) $H_3^+N-CH(R)-COOH$ (B) $H_3^+N-CH(R)-COO^-$
(C) $H_2N-CH(R)-COO^-$ (D) All of the above

34. Lipids are generally _____ insoluble.
(a) fat (b) water
(c) lipid (d) all

35. Lipids could be a _____ fatty acids or has a _____ group attached to an R – group.
(a) Carboxyl; fatty acid
(b) Fatty acid; simple
(c) Carboxyl; simple
(d) Simple; carboxyl

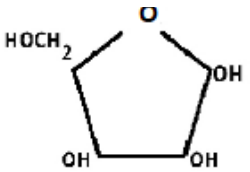
36. The R – group attached to the carboxyl group in a lipid could be a
(a) $-CH_3$ (b) $-C_2H_5$
(c) Higher number of $-CH_2$
(d) All of the above

Topic 2 — Primary and Secondary Metabolites

37. Alkaloids; Flavonoids; Rubber; Essential oils; antibiotics; coloured pigments; scents; Gums spices.
How many of the above are primary metabolites?
(a) 7 (b) 9
(c) 5 (d) None

38. Few _____ metabolites have ecological importance's.
(a) Primary & Secondary
(b) Secondary & Primary
(c) Only Primary
(d) Only Secondary

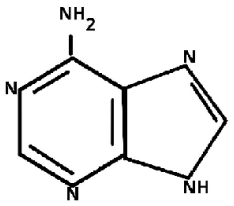
39. The diagram represents:-



(a) Ribose (b) Glucose
(c) Both (d) None

40. $CH_3 - (CH_2)_{14} - COOH$
(a) A glycerol molecule
(b) A fatty acid
(c) An amino acid
(d) A carbohydrate

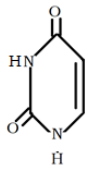
41. Which of the following compound is shown in the figure?

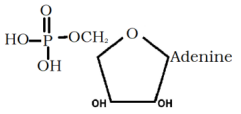


(a) A purine (Adenine)
(b) A pyrimidine (Uracil)
(c) A purine (Uracil)
(d) A pyrimidine (Adenine)

42. Which of the following is a Nucleoside?
(a) Adenylic acid (b) Uridine
(c) Thymidylic acid (d) All

43. How many of the following are nitrogen bases?

i) 

ii) 

iii) Guanine iv) Uracil
(a) All four (b) Only three
(c) Only two (d) Only one

44. Which of the following group represents Lectins?
(a) Abrin; Ricin
(b) Monoterpenes; Diterpenes
(c) Concanavalin – A
(d) None of the above

Topic 3 Biomacromolecules

45. They have molecular weight ranging from 18 to around 800 Da.

The above written statement represents which substance?
(a) About biomacromolecules
(b) One feature common to all those compounds found in the acid insoluble fraction.
(c) Both (a) and (b)
(d) None

46. How many of the following statements are incorrect?
i) Acid insoluble fraction has only four types of organic compounds.
ii) All the compound in acid-insoluble fraction have molecular weight in range of 10,000 Da and above.
iii) Molecular weight less than one thousand Dalton are usually referred to as Micromolecules.
iv) Biomacromolecules are simply known as Biomolecules.
(a) 1 (b) 2
(c) 3 (d) 4

47. How many of the following statement is/are true regarding lipids in Biomacromolecules?
i) Lipids are polymeric substances.
ii) Have molecular weight less than 10,000 Da.
iii) Molecular weight do not exceed 800 Da.
(a) only i) & ii) (b) only iii)
(c) All i); ii) & iii) (d) only ii) & iii)

48. Which of the following statement is incorrect?
(a) After grinding cell membrane forms the vesicles.
(b) Vesicles are water soluble.
(c) Lipids are not strictly Biomacromolecules
(d) None of the above

49. The acid soluble pool roughly represents _____composition.
(a) Cytoplasmic (b) Nuclear
(c) Mitochondrial (d) None

50. The macromolecules from the cytoplasm and organelles become the-
(a) Retentate (b) Slurry
(c) Filtrate (d) All

51.

Component	% of the total cellular mass
Water	70 – 90
i)	10 – 15
ii)	3
Lipids	iii)
iv)	5 – 7
Ions	1

(a) i) protein
ii) Carbohydrates
iii) 2
iv) Nucleic acids

(b) i) Carbohydrates
ii) Nucleic acid
iii) 2
(iv) Protein

(c) i) Nucleic acid
ii) Protein
iii) 2
iv) Carbohydrates

(d) i) Nucleic acid
ii) Carbohydrates
iii) 2
iv) Protein

Topic 4 | Proteins

52. Proteins are:-
(a) Polypeptides
(b) Linear chains of amino acid linked by peptide bonds
(c) Polymer of amino acids
(d) All of them.

53. A protein if a heteropolymer:-
(a) It contains only one types of amino acids.
(b) it contains different types of amino acids.
(c) both
(d) None

54. Which statement is incorrect?
(a) Homopolymers have only one type of monomer repeating 'n' number of times
(b) Dietary proteins are source of essential amino acids.
(c) Amino acids could be essential or non – essential
(d) Essential amino acids are synthesized in our body.

55. What are functions of proteins?
i) Carry out many functions in living organism
ii) Transporter of nutrients
iii) Fight infections
iv) Regulates in the form of hormones & enzymes
(a) Only two (b) Only three
(c) Only four (d) None

56. The most abundant enzyme in animal world is ___i)____ while in whole of the biosphere is ___ii)____
(a) (i) Collagen (ii) PEPcase
(b) (i) RuBisCO (ii) PEPcase
(c) (i) Collagen (ii) RuBisCO
(d) None of them

Topic 5 | Polysaccharide

57. Polysaccharide is the part of ____
(a) Insoluble fraction
(b) Insoluble pellet
(c) Retentate
(d) All

58. A polysaccharide contains
(a) Different Monosacharides
(b) Same type of monosaccharide
(c) like cellulose
(d) All of these

59. Cellulose and starch is a homopolymer of
(a) Glucose (b) Fructose
(c) Galactose (d) None

60. Which of the following statement is incorrect?
(a) Starch is a a polysaccharide heteropolymer.
(b) Inulin is a polymer of fructose
(c) In a polysaccharide chain, right end is reducing while left end is non – reducing.
(d) Starch forms helical secondary structures.

61. (I) Starch produces blue colour after binding with I_2
(II) Cellulose cannot hold I_2

(a) Both are wrong
(b) Both are correct
(c) (I) is correct (II) is incorrect
(d) (II) is correct (I) is incorrect

62. Paper made from plant pulp and cotton fibre is
(a) Starch only
(b) Cellulose
(c) Complex polysaccharide
(d) Both (b) & (c)

63. What are examples of homopolymers?
(a) N – acetyl galactosamine; Glucosamine
(b) Amino acids; sugars
(c) Chitin
(d) None

Topic 6 Nucleic Acids

64. Nucleic acids are:-
(a) Polynucleosides (b) Polynucleotides
(c) Both (d) None

65. A nucleotide has ____ chemical distinct components.
(a) Only one (b) Two
(c) Three (d) Four

66. A heterocyclic compound in Nucleic acid is:
(a) N_2 – base (b) Sugar
(c) Fatty acid (d) All

67. Adenine and _____ are _____ purines
(a) Cytosine; Substituted
(b) Guanine; Substituted
(c) Uracil; Substituted
(d) Guanine; Unsubstituted

68. The sugar found in polynucleotides is either ribose (_____) or _____
(a) 2' deoxyribose; monosaccharide
(b) Monosaccharide; 2' deoxyribose
(c) Disaccharide; 2' deoxyribose
(d) Disaccharide; Monosaccheride

Topic 7 Structure of Proteins

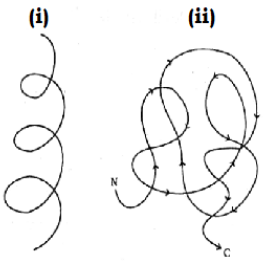
69. In a protein the left end represents:-
(a) First amino acid & C – terminal
(b) Last amino acid &N – terminal
(c) First amino acid & N – terminal
(d) Last amino acid & C – terminal

70. In a protein the right end represents
(a) First amino acid & C – terminal
(b) Last amino acid &N – terminal
(c) First amino acid & N – terminal
(d) Last amino acid & C – terminal

71. Which of the following statement is incorrect?
(a) A protein thread is folded in the form of a helix.
(b) Only some portion of the protein thread are arranged in the form of a helix
(c) In proteins only left handed helices are observed.
(d) Both (b) & (c)

72. The long protein chain is also folded upon itself like a hollow woolen ball known as:-
(a) Primary structure
(b) Secondary Structure
(c) Tertiary structure
(d) None of the above

73. Identify the diagram given below



(a) (i) Primary (ii) Secondary
(b) (i) Secondary (ii) Tertiary
(c) (i) Tertiary (ii) Primary
(d) None of the above

74. Protein polypeptides or subunits arranged with respect to each other is called the
(a) Primary structure
(b) Tertiary structure
(c) Quaternary structure
(d) Secondary structure

75. A adult human Hb (Haemoglobin) consists of _____ subunits.
(a) 1 (b) 2
(c) 3 (d) 4

76. _____ subunits of α – type and ____ of β – type together constitute the human haemoglobin(Hb):-
(a) 2; 4 (b) 2; 2
(c) 4; 2 (d) 4; 4

Topic 8 | Nature of Bond Linking Monomers in a Polymer.

77. In polypeptide, amino acids are linked by
(a) H – bond
(b) Glycosidic Bond
(c) Peptide bond
(d) Peptide and H – bond both

78. Choose the correct statement about peptide bond
(a) It is formed when carboxyl(-COOH) group of one amino acids reacts with carboxyl ($–NH_2$) group of other amino acid.
(b) It is formed when amino ($-NH_2$) group of one amino acid reacts with carboxyl (-COOH) group of other amino acid.
(c) It is formed when carboxyl group (-COOH) of one amino acid reacts with amino ($-NH_2$) group of other amino acid.
(d) It is formed when amino ($-NH_2$) group of one amino acid reacts with amino ($-NH_2$) group of other amino acid.

79. Peptide bond is formed by-
(a) Elimination of water moiety i.e., rehydration
(b) Addition of water moiety i.e., rehydration
(c) Addition of water moiety i.e., dehydration
(d) Elimination of water moiety i.e., dehydration

80. Polysaccharide is formed by linking of monosaccharide by-
(a) H – bond (b) S – bond
(c) Peptide bond (d) Glycoside bond

81. Dehydration is the cause of formation of –
(a) Peptide bond (b) Glycosidic bond
(c) Both (a) & (b) (d) None of these

82. Glycosidic bond is formed between monosaccharide while linking-
(a) Carbon & Carbon
(b) Carboxyl & amino group
(c) Carbon & Hydrogen
(d) Carbon & Oxygen

83. Match Column- I & Column – II

	Bond (Column- I)		**Occurrence Column – II**
A,	Peptide bond	(i)	Between Nitrogenous bases of nucleic acid
B.	Glycosidic bond	(ii)	Between adjacent amino acid
C.	Ester bond	(iii)	Between phosphate & hydroxyl group of sugar
D.	H – bond	(iv)	Between adjacent carbon of monosaccharide

(a) A – i, B – ii, C – iii, D – iv
(b) A – ii , B – iv , C – i, D – iii
(c) A – iii, B – iv, C – i, D – ii
(d) A – ii, B – iv, C – iii, D – i

84. In nucleic acid, phosphate links –
(a) 3' carbon of both sugar of succeeding sugar
(b) 3' carbon of one sugar & 5' carbon of the other sugar of succeeding nucleotide
(c) 5' carbon of one sugar of succeeding sugar.
(d) 5' carbon of one sugar & 3' carbon of other group of succeeding nucleotide.

85. What is / are the number of ester bonds & phosphodiester bonds on either side of nucleic acid respectively?
(a) 1, 2 (b) 1, 1
(c) 2, 1 (d) 2, 2

86. The famous Watson – Crick model is related to-
(a) Nucleic acid (DNA)
(b) Protein
(c) Carbohydrate
(d) Enzymes

87. How many of following is / are correct with respect to Watson – Crick model?
i) DNA exists as a double helix
ii) The strands of polynucleotides are antiparallel.
iii) Backbone is formed by sugar only.
iv) Nitrogen bases faces inside
v) A of one strand bond with U on other strand
(a) 2 (b) 3
(c) 4 (d) All fives

88. Choose the correct nitrogen base pairing of DNA.
(a) A ≡ T (b) A = U
(c) A = T D) A ≡ U

89. Each step of ascent is represented by how many pairs of bases according to Watson – Crick model?
(a) 1 (b) 2
(c) Zero (d) None of these

90. At each of ascent, the strand turns ___.
(a) 63° (b) 36°
(c) 34° (d) 3.4°

91. One full turn of helix strand of B – DNA involves how many nitrogen bases?
(a) 10 (b) 20
(c) 2 (d) none of these

92. Choose the correct statement regarding B – DNA.
(a) Pitch would be 36 A°
(b) The rise per base pair would be 3.4 A°
(c) Pitch would be 3.4A°
(d) The rise per base pair would be 36 A°

93. Cytosine (C) bond with _____by _____ H – bond.
(a) Guanine (G); 2 (b) Thymine; 2
(c) Guanine (G); 3 (d) Thymine; 3

Topic 9 Dynamic State of Body Constituent's Concept of Metabolism

94. What is 'turn over'?
(a) Biomolecules are never changed into some other biomolecules and also made from some other biomolecules.
(b) Biomolecules are constantly being changed into some other biomolecules but never made from some other biomolecules.
(c) Biomolecules are never being changed into some other biomolecules nor being made from some other biomolecules.
(d) Biomolecules are constantly being changed into some other biomolecules and also made from some other biomolecules.

95. The breaking & making through chemical reactions which occur constantly in living organism are called-
(a) Metabolism (b) Anabolism
(c) Catabolism (d) none of these

96. Amine are formed by-
(a) removal of (-COOH) from amino acid
(b) removal of (CO_2) from amino acid
(c) addition of (CO_2) to amino acid
(d) addition of (COOH) to amino acid

97. Metabolites are converted into each other in a series of linked reactions called_____.
(a) Catabolic pathway only
(b) Anabolic pathway only
(c) Metabolic pathway
(d) None of these

98. Metabolic pathway are-
(a) Linear only
(b) Circular only
(c) May be linear or circular
(d) None of them

99. How many uncatalysed metabolic conversion is / are found in living system?
(a) 1
(b) More than 1 but less than 100
(c) Zero
(d) Thousand

Topic 10 Metabolic Basis for Living

100. Metabolic pathway that leads to a more complex structure from a simple structure is / are
(a) Anabolic pathway
(b) Catabolic pathway
(c) Both (a) & (b)
(d) None of these

101. Choose the correct about catabolic pathway:
i) Metabolic pathway that leads to simpler structure from a complex structure.
ii) Glucose becomes lactic acid in our skeletal muscles
iii) Acetic acid becomes cholesterol.
iv) Metabolic pathway that leads to more complex structure from a simpler structure.
(a) i & iii (b) i & ii
(c) iv & ii (d) iv & iii

102. Which of following expect to consume energy?
i) When glucose is degraded to lactic acid
ii) Assembly of protein from amino acid
iii) Anabolic pathway
iv) Catabolic pathway
(a) i & iii (b) i & iv
(c) ii & iii (d) ii & iv

103. How many of the following is /are correct about glycolysis?
i) Formation of glucose from lactic acid
ii) Occur in ten (10) metabolic step.
iii) Energy liberated during degradation is store in the form of chemical bond.
iv) Formation of lactic acid from glucose
(a) i, ii, iii (b) ii, iii, iv
(c) i & ii (d) i & iv

104. Energy currency in living system is –
(a) Adenosine triphosphate
(b) Glucose
(c) Protein
(d) Enzyme

105. Bioenergetics deals with-
(a) How do living organisms derive their energy
(b) How do living organisms store energy & in what form.
(c) How do living organismsw convert energy into work.
(d) All of these

Topic 11 The Living State

106. The blood concentration of glucose in normal healthy individuals is
(a) Less than 2.4 mmol/L
(b) More than 10 mmol/L
(c) 4.2 mmol/L – 5.0 mmol/L
(d) None of these

107. Living state is –
(a) Equilibrium steady – state to be not to perform work.
(b) Non – equilibrium steady – state to be not to perform work.
(c) Equilibrium steady – state to be able to perform work.
(d) Non – equilibrium steady – state to be able to perform work.

108. Living process is a constant effort to prevent falling into equilibrium. This is achieved by –
(a) Energy output (b) energy input
(c) Both of these (d) None of these

Topic 12 Enzymes

109. Enzymes are chemically –
(a) Protein (b) Carbohydrate
(c) Lipid (d) Nucleic acid

110. Ribozymes are chemically
(a) Protein (b) Lipid
(c) Carbohydrate (d) Nucleic acid

111. What is the difference between inorganic catalyst and enzyme catalyst?
(a) Inorganic catalysts work efficiently at low temperature but enzymes of only thermophilic organisms work efficiently at low temperature
(b) Inorganic catalyst work efficiently at high temperature but enzyme get damaged at high temperature except of microbes that live in hot water sulphur springs
(c) Inorganic catalyst are not efficient at high temperature but enzymes of all living organism work efficiently at high temperature.
(d) None of these

112. Choose the correct statements regarding "active site."
1) Substrate fits into it
2) Enzymes catalyst through active site show low rate
3) It forms by crevices or pockets made by primary protein only.
4) It form by crevices or pockets made by tertiary protein structure
(a) 1, 2, 3 (b) 1, 2, 4
(c) 1, 3 (d) 1, 4

Topic 12.1 Chemical Reaction

113. Physical change refers to –
(a) Change in shape without breaking bonds.
(b) Change in state of matter
(c) Ice, water, water vapour.
(d) All of these

114. Chemical change differ from physical change in
(a) Dissociation of bond
(b) Formation of new bond
(c) Both (a) and (b)
(d) There is no difference in both

115. Hydrolysis of starch into glucose is -
(a) Inorganic chemical reaction
(b) Organic chemical reaction
(c) Physical changes
(d) (a) and (b) both

116. Rate of physical or chemical process refers to –
(a) amount of reactant formed per unit time
(b) amount of product formed per unit
(c) differential of time with respect to produce
(d) differential of product with respect to time

117. Choose the correct statement:
(a) Rate can be called velocity if the direction is not specific.
(b) Rate of physical & chemical processes are not influenced by temperature
(c) Catalysed reaction proceeds at rates vastly lower than that of uncatalysed ones.
(d) Catalysed reaction proceeds at rates vastly higher than that of uncatalysed ones.

118. Choose the correct response:
(a) For every increase by 10°C, rate is double
(b) Rate decrease by one – fourth by decrease in temperature by 10°C.
(c) When enzymes catalysed reaction are observed the rate would be vastly lower than the same but uncatalysed reaction.
(d) None of these

119. Choose correct response with respect to given equation:-
Carbon dioxide + water $\rightleftharpoons$ carbonic acid
(a) Carbonic anhydrase is enzyme required for accelerated reaction.
(b) In absence of enzyme, still this reaction is fast enough
(c) 200 molecules of H_2CO_3 being per hour formed by enzyme accelerated reaction.
(d) 600,000 molecules of H_2CO_3 being formed every second in absence of any enzyme.

120. Which of the following is the correct chemical formula for pyruvic acid?

(a) $C_2H_3O_4$ (b) $C_3H_3O_3$

(c) $C_3H_4O_3$ (d) $C_6H_{12}O_6$

121. Match Column – I and Column – II

	Column – I (Metabolic pathway)		Column – II (Occurrence)
A.	Formation of alcohol	(i)	Anaerobic condition of skeletal muscle
B.	Formation of pyruvic acid	(ii)	Yeast
C.	Formation of lactic acid	(iii)	Aerobic condition of normal human cell

(a) A - I, B -iii, C -ii

(b) A-iii, B -ii, C -i

(c) A -ii, B -I, C -iii

(d) None of these

Topic 12.2 How do Enzymes bring about such High Rates of Chemical Conversions?

122. Which of the following is correct about enzymes?

(a) It is 2 – D structure

(b) Convert product into substrate

(c) They have active site

(d) All of these

123. Transition state structure is formed when –

(a) Enzyme is free

(b) Enzyme bound with product

(c) 'ES' complex

(d) Substrate structure do not change until product formed.

124. Which of following are unstable?

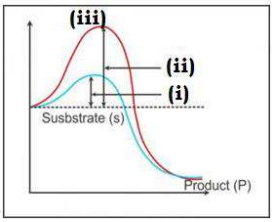
(a) Enzymes

(b) Products

(c) Reactants

(d) Intermediate structural states.

125.



	(i)	(ii)	(iii)
A)	Activation energy without enzyme	Transition state	Activation energy with enzyme
B)	Transition state	Activation energy without enzyme	Activation energy with enzyme
C)	Activation energy with enzyme	Activation energy without enzyme	Transition state
D)	Activation energy without enzyme	Activation with enzyme	Transition state

126. Choose the correct response:

i) Y – axis represent potential energy

ii) X – axis represent substrate

iii) Y – axis represent progress of reaction

iv) X – axis represent state through transition state

(a) i) & ii) B) iii) & iv)

(c) i) & iv) (c) ii) & iii

127. If 'P' (product) is at lower level than 's' (substrate), the reaction is _____

(a) Endothermic reaction

(b) Exothermic reaction

(c) Spontaneous reaction

(d) Both (a) and (c)

Topic 12.3 Nature of Enzyme Action

128. Which is the correct way to represent enzyme action?

(a) $E + S \rightleftharpoons ES \rightleftharpoons EP \rightleftharpoons E + P$

(b) $E + S \rightleftharpoons E + P$

(c) $E + S \rightleftharpoons ES \rightleftharpoons EP \rightleftharpoons E + P$

(d) $E + S \rightleftharpoons ES \rightleftharpoons EP \rightleftharpoons E + P$

129. ES complex is _____ and dissociates into _____ and _____
(a) Long lived; product; changed enzyme
(b) Short lived; reactant, changed enzyme
(c) Long lived, reactant, unchanged enzyme
(d) Short lived, product, unchanged enzyme

130. Arrange in correct sequence of catalytic cycle of an enzyme action:
i) The active site of the enzyme, now in close proximity of the substrate breaks the chemical bonds of the substrate and the new enzyme product complex is formed
ii) The substrate binds to the active site of enzyme, fitting into the active site
iii) The enzyme release the products of the reaction and the free enzyme is ready to bind to another molecule of the substrate
iv) The binding of the substrate induces the enzyme to alter its shape, fitting more tightly around the substrate.
(a) i → ii → iii→ iv
(b) i → iii → ii → iv
(c) ii → iv → iii → i
(d) ii → iv → i → iii

Topic 12.4 Factors Affecting Enzyme Activity

131. Which of the following can change enzyme activities?
(a) All such activities that can alter the tertiary structure of the protein
(b) Temperature pH
(c) Substrate conditions
(d) All of these

132. Enzyme activity declines-
(a) Above the optimum value
(b) Below the optimum value
(c) (a) and (b) both
(d) Enzyme activity never decline

133. Optimum pH refers to –
(a) pH at which enzyme activity is lowest
(b) pH at which enzyme activity is highest
(c) pH at which enzyme activity started immediately
(d) pH at which enzyme activity ended completely

134. Choose response with respect to enzyme activities:
i) Low temperature destroys enzyme
ii) High temperature preserves enzyme in a temporarily inactive state
iii) Optimum temperature is temperature at which enzyme activity is highest
iv) As temperature increase, enzyme activity increase until optimum and thereafter increase in temperature lead to decline in enzyme activities
v) As temperature increase enzyme activities is zero until optimum temperature & thereafter increase in temperature lead to increase in enzyme activities
(a) i, iii, iv (b) ii, v
(c) i, iv, v (d) iii, iv

135. As pH increase, enzyme activity-
(a) Constantly increase
(b) Constantly decrease
(c) No effect
(d) Increase until optimum and decrease at further pH

136. With increase in substrate concentration, the velocity of the enzymatic reaction –
(a) Constantly increase
(b) Rise at first until V_{max} and further no rise
(c) No effect
(d) Decrease first until V_{max} and increase further

137. After reaching V_{max}, the enzymatic reaction does not exceed by any further rise in concentration of substrate because-
(a) Enzymes molecules are fewer than substrate molecules

(b) After saturation of those enzyme molecules these are no free enzyme molecules to bind with additional substrate molecules
(c) (a) and (b) both
(d) After saturation of those enzyme molecules, enzyme get changed in it's form.

138. When the binding chemical shut off enzyme activity, the process is called _____ and the chemical is called_____
(a) Inhibition; inhibitor
(b) Inhibition; cofactors
(c) Exhibition, exhibitor
(d) None of these

139. What effect is observed on enzyme activity due to inhibitor?
(a) It fasten enzyme kinetics
(b) It decline enzyme kinetics
(c) It shut off enzyme kinetics
(d) No effect on enzyme kinetics

140. Inhibition of succinic dehydrogenase by malonate is due to
(a) Malonate closely resembles with substrate succinate in structure
(b) Malonate is competitive inhibitor
(c) It binds with active site of succinic dehydrogenase in place of substrate
(d) All of these

141. Competitive inhibitors are often used in the control of –
(a) Viral pathogen
(b) Bacterial pathogen
(c) Both (a) and (b)
(d) None of these

Topic 12.5 Classification & Nomenclature of Enzyme

142. Enzyme are divided into how many classes?
(a) 2 (b) 4
(c) 6 (d) 8

143. Each classes of enzyme were further classification into_____ subclass and named by ___ digit
(a) 13; 4 – 13 (b) 4 – 13; 13
(c) 4 – 13; 4 (d) 4; 4 – 13

144. S reduced + S' oxidised ® S oxidised + S' reduced
(a) Oxidoreductase (b) Dehydrogenase
(c) Transferase (d) (a) and (b) both

145. Enzyme catalysing a transfer of a group i.e. ,hydrogen between pair of substrate S and S' is-
(a) Transferase (b) Oxidoreductase
(c) Lyases (d) Ligases

146. Transferase enzyme catalyse transfer of a group, G between pair substrate S & S'. G is other than –
(a) Oxygen (b) Amino
(c) Hydrogen (d) Carbon

147. Hydrolases catalyse –
i) Hydrolysis of ester, ether, peptide, glycosidic,
ii) C – C breakdown
iii) C – halide breakdown
iv) P – N breakdown
(a) (i) only
(b) (i) & (ii) only
(c) (iii) & (iv) only
(d) i, ii, iii & iv

148. Lysase catalyse _ _ _ _ _ _ of groups from substrates by mechanism other than hydrolysis leaving _ _ _
A. Addition ; double
B. Removal ; double
C. Addition ; single
D. Removal ; triple

149. Isomerases catalyse inter-conversion of:
A. Optical isomer
B. Geometrical isomer
C. Position isomer
D. All of these

150. Linking of two compound is achived by-
(a) Lyases (b) Transferase
(c) Ligases (d) Hydrolase

151. Ligase catalyse-
(a) Joining of C-O
(b) Oxidation – reduction of substrate
(c) Hydrolysis of C-C
(d) Conversion of optical isomer

Topic 12.6 Co-factors

152. Cofactors are:-
(a) Proteinous part of enzyme
(b) Non-proteinous part of enzyme
(c) Bound to substrate
(d) Bound to enzyme to make enzyme catalytically retard

153. How many kind of cofactors may be identified?
(a) 1 (b) 2
(c) 3 (d) Zero

154. Cofactors are _ _ _ _ _ _ and apoenzyme are _ _ _ _ part of enzyme.
(a) Protein; protein
(b) Non-protein; non-protein
(c) Protein; non-protein
(d) Non-protein; protein

155. Prosthetic group are _ _ _ _ _ and are distinguished from other cofactors in that they are _ _ _ _ _ bound to apoenzyme.
(a) Organic compound; tightly
(b) Organic compound; loosely
(c) Inorganic compound; loosely
(d) Inorganic compound; tightly

156. Which of following is/are correct?
(i) Haem is prosthetic group.
(ii) Haem is apoenzyme.
(iii) Haem is not part of active site of peroxidase.
(iv) Haem catalyse the formation of hydrogen peroxide from water & oxygen.
(v) Haem is part of active site of peroxidase.
(vi) Haem catalyse the breakdown of hydrogen peroxide into water & oxygen.
(a) i , iii , vi (b) ii , iv , v
(c) i , v , vi (d) ii , v , vi

157. NAD & NADP contain-
(a) Vitamin niacin (b) Vitamin C
(c) Vitamin D (d) Vitamin K

158. Full form of NAD is:-
(a) Nicotinamide adenine nucleotide
(b) Nicotinamide adenine dinucleoside
(c) Nicotinamide adenine dinucleotide
(d) Nicotinamide adenine nucleoside

159. Choose correct response from following with respect to carboxypeptidase.
(a) Zinc are found as apoenzyme
(b) It is proteolytic enzyme
(c) Cofactor from covalent bond with side chain at active site
(d) Between cofactor and substrate ionic bond is formed

160. How many coordination bonds are found in activity of carboxypeptidase?
(a) Only one ; between cofactor and side chain at active site
(b) Two between cofactor and side chains at active site and at to the same time form one or more coordination bonds with substrate.
(c) Zero
(d) Only one ; between cofactor & substrate

161. Find mismatch.

	Column-I		**Column-II**
(a)	Carboxypeptidase	(i)	Zinc
(b)	NADP	(ii)	Niacin
(c)	Haem	(iii)	Peroxidase
(d)	NAD	(iv)	Zinc

162. When cofactor is removed from enzyme; what effect is observed?
(a) Catalytic activity is lost
(b) Catalytic activity is enhanced
(c) Catalytic activity is fixed at optimum
(d) None of these

71. (c) 72. (c) 73. (b) 74. (c) 75. (d) 76. (b) 77. (c) 78. (c) 79. (d) 80. (d)
81. (c) 82. (a) 83. (d) 84. (b) 85. (b) 86. (a) 87. (b) 88. (c) 89. (a) 90. (b)
91. (a) 92. (b) 93. (c) 94. (d) 95. (a) 96. (b) 97. (c) 98. (c) 99. (c) 100. (a)
101. (b) 102. (c) 103. (b) 104. (a) 105. (d) 106. (d) 107. (d) 108. (b) 109. (a) 110. (d)
111. (b) 112. (d) 113. (d) 114. (c) 115. (b) 116. (b) 117. (d) 118. (a) 119. (a) 120. (c)
121. (d) 122. (c) 123. (c) 124. (d) 125. (c) 126. (c) 127. (b) 128. (c) 19. (d) 130. (d)
131. (d) 132. (c) 133. (b) 134. (d) 135. (d) 136. (b) 137. (c) 138. (a) 139. (c) 140. (d)
141. (b) 142. (c) 143. (c) 144. (d) 145. (a) 146. (c) 147. (d) 148. (b) 149. (d) 150. (c)
151. (a) 152. (b) 153. (c) 154. (d) 155. (a) 156. (c) 157. (a) 158. (c) 159. (b) 160. (b)
161. (d) 162. (a)