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BIOMOLECULES

Biomolecules

All the carbon compounds that we get from living tissues.

Biomicromolecules: Molecules which have molecular weights less than one thousand Dalton. They are also known as monomers.

Biomacromolecules: Have molecular weight more than 10000 Daltons (generally 10,000 Daltons and above). They are generally polymers. A biomolecule a with molecular weight in the range of ten thousand daltons and above; found in acid insoluble fraction. e.g. polysaccharides, nucleic acids, proteins and lipids.

Primary and secondary metabolites

- **Primary metabolites:** have identifiable functions and play important roles in normal physiological process eg. Amino acids, nitrogenous bases, proteins and nucleic acid.
- Secondary metabolites: are product of certain metabolic pathways from primary metabolites, eg. carotenoids, drugs, alkaloids, essential oils, rubber, gum, cellulose and resins etc.

Amino acids

Organic compounds containing an amino group and one carboxyl group (acid group) and both these groups are attached to the same carbon atom called a carbon and so they are called amino acids.



e.g. In Glycine R = H

In alanine R = CH₃

In serine $R = CH_2 - OH$

Twenty types of amino acids. Amino acid exists in Zwitterionic form at different pHs.



Based on number of amino and carboxyl groups, amino acids can be:

Aromatic: Tryptophan, phenylalanine and Tyrosine are aromatic (give smell) amino acids.

Proteins: Proteins are polypeptide chains made up of amino acids. There are 20 types of amino acids joined together by peptide bond between amino and carboxylic group. There are two kinds of amino acids.

Essential amino acids are obtained by living organism along with food.

Non-essential amino acids can be prepared by our body from raw materials.



Biological macromolecules

There are three main types of biological macromolecules, according to mammalian systems:

- Carbohydrates
- Nucleic acids
- Proteins
- Lipids

Carbohydrates: Carbohydrates are polymers of carbon, hydrogen and oxygen. They can be classified as monosaccharides, disaccharides and polysaccharides. Carbohydrates are found in starch, fruits, vegetables, milk and sugars. They are an important source of a healthy diet.

Nucleic Acids: The nucleic acids include DNA and RNA that are the polymers of nucleotides. Nucleotides comprise a pentose group, a phosphate group, and a nitrogenous base group. All the hereditary information is stored in the DNA. The DNA synthesized into RNA and proteins.

Proteins: Proteins are the polymers of amino acids. These include the carboxylic and the amino group. There would be no lipids or carbohydrates without proteins because the enzymes used for their synthesis are proteins themselves.

Lipids: Lipids are a hydrophobic set of macromolecules, i.e., they do not dissolve in water. These involve triglycerides, carotenoids, phospholipids, and steroids. They help in the formation of the cell membrane, formation of hormones and in the and as stored fuel.

Fatty Acids & Saturated

With single bonds in carbon chain, e.g., Palmitic acid, butyric acid.

Unsaturated

With one or more double bonds, e.g., oleic acid, linoleic acid.

Glycerol



-R1

R2

-C---R3

A simple lipid, is trihydroxy propane.

Some lipid have fatty acids esterified with glycerol. Example of fatty acid (Palmitic acid)

CH₂—O—

CH2-0-

(CH₃ — (CH₂)₁₄ — COOH)



Nitrogen bases (Carbon compounds with heterocyclic rings)

Purine: Adenine, Guanine,

Pyrimidine: Cytosine, Uracil, Thymine.

Nucleoside: Nitrogenous base + Sugar e.g., Adenosine, guanosine.

Nucleotide: Nitrogenous base + Sugar + Phosphate group. e.g. Adenylic acid, Guanylic acid. Thymidylic acid.

Nucleic acids: Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).

Examples of Macromolecules:

Synthetic Fibres

- Nylon, rayon and spandex consist entirely of macromolecules. These are created in certain steps:
- The monomers are reacted to make prepolymers or a liquid, primitive

macromolecule. In the next step, the prepolymers are fed through a cell where it solidifies and attains the desired thickness. This process is called spinning.

Genetic Transfer: DNA is a genetic material that contains nucleic acids which code for genetic material. During meiosis, the DNA is no longer a whole, and the nucleotides that remain are responsible for transferring the genetic information to the gametes.

Monomers and Polymers

Macromolecules are basically polymers, long chains of molecular sub-units called monomers. Carbohydrates, proteins and nucleic acids are found as long polymers. Due to their polymeric nature and large size, they are known as macromolecules.

Structure of Proteins

- **Primary structure:** Is found in the form of linear sequence of amino acids. First amino acid is called N-terminal amino acid and last amino acid is called C-terminal amino acid.
- Secondary structure: Polypeptide chain undergoes folding or coiling which is stabilized-by hydrogen bonding. Right handed helices are observed; e.g., fibrous protein in hair, nails.
- Tertiary structure: Long protein chain is folded upon itself like a hollow woollen ball. Gives a 3-dimensional view of protein, e.g., myosin.
- **Quaternary structure:** Two or more polypeptides with their folding's and coiling's are arranged with respect to each other, e.g., Human haemoglobin molecule has 4 peptide chains 2 a and 2 β Subunits.

Monosaccharides

Monosaccharides are joined by glycosidic bond, right end is reducing and left end is non reducing.

Polysaccharides

Are long chain of polymers of monosaccharides.

- **Starch:** Store house of energy in plant tissues. Forms helical secondary structures, made of only glucose monomers.
- **Cellulose:** Homopolymer of glucose. It does not certain complex helices. Cotton fibre is cellulose.
- **Glycogen:** Is a branched homopolymer, found as storage polysaccharide in animals.
- Insulin: Is a polymer of fructose.
- **Chitin:** Chemically modified sugar (amino-sugars) N-acetyl galactosamine form exoskeleton of arthropods; heterpolymer.

Metabolic Pathways

There are two types of metabolic pathways:

- Anabolic pathways: Lead to formation of more complex structure from a simpler structure with the consumption of energy, e.g., Protein from amino acids., also known as biosynthetic pathways.
- **Catabolic pathway:** Lead to formation of simpler structure from a complex structure, e.g., Glucose → Lactic Acid + energy The most important energy currency in living systems is ATP (adenosine tri phosphate).

Bonds linking monomers in a polymer

Peptide bond: Formed between the carboxyl (–COOH) group of one amino acid, and the amino (– NH₂) group of the next amino with the elimination of water moiety, (dehydration).

Glycosidic bond: Bond formed between two carbon atoms of two adjacent monosaccharides., by dehydration.

Phosphodiester bond: Bond formed in nucleic acids where in a phosphate moiety links the 3-carbon of one sugar of one nucleotide to the 5-carbon of the sugar of the succeeding nucleotide. (The bond between phosphate group and hydroxyl group of sugar)

Enzymes

- Enzymes are commonly proteinaceous substances which are capable of catalysing chemical reactions of biological origin without themselves undergoing any change. They are commonly called as biocatalysts.
- The nucleic acids that behave like enzymes are called ribozymes.
- The tertiary structure of protein/Enzyme has pockets or crevice into which substrate fit to form ES complex.
- The formation of the ES complex is essential for catalysis. E + S = ES \rightarrow EP \rightarrow E + P
- The structure of substrate gets transformed into the structure of product through formation of transient state structure.
- The major difference between inorganic and organic catalyst is inorganic catalyst works effectively at high temperature and pressure but enzyme get damaged at high temperature.
- The external energy required to start a chemical reaction is called activation energy.



Factors influencing Enzyme Activity:

- **Temperature:** An enzyme is active within a narrow range of temperature. Temperature ate which enzyme is most active is called optimum temperature. The enzyme activity decrease above and below this temperature.
- **pH:** Every enzyme has an optimum pH at which it is maximum active. Most of the intracellular enzymes work at neutral pH.
- **Concentration of Substrate:** Increase in substrate concentration increases the rate of reaction due to occupation of more active sites by substrate.
- **Competitive Inhibitor:** When the molecular structure of inhibitor resembles the substrate, it inhibits the function of enzymes.

Enzymes are classified as:

- i. Oxidoreductases/ Dehydrogenases: S reduced + S' oxidized S oxidized + S' reduced
- ii. Transferases: S G + S' S + S' G
- iii. Hydrolases: Catalyses the hydrolysis of peptide, ester, glycosidic bonds et
- iv. Lyases: Remove the groups from substrate.
- v. Isomerases: Inter conversion of optical, geometrical or positional isomers.
- vi. Ligases: Catalyses the linking together of two compounds.

Co-factors

Co-factors are the non-protein constituent of an enzyme which make the enzyme more catalytically active. The protein portions of enzyme are called apoenzyme.

• **Prosthetic group:** These are organic compound which tightly bound to the apoenzyme.

e.g., Haem is prosthetic group in peroxidase and catalase.

• **Coenzyme:** These are organic compounds whose association with the apoenzyme is only transient, usually occurring during the course of catalysis.

	e.g., Coenzyme Nicotinamide adenine dinucleotide (NAD) and NADP contain vitamin niacin.
	 Metal ions: Metal ions form coordination bond with side chains at the active site and at the same time form one or more coordination bond with substrate.
	e.g., zinc in enzyme carboxy peptidase.
	NCERT LINE BY LINE QUESTIONS
1.	Elemental analysis on a plant tissue, Animal tissue or a microbial paste reveals:- [Pg-142,E]
	A) list of elements like C; H; O & several others
	B) Respective content per unit mass of a living tissue
	C) Bound
2.	Elemental list could be in terms of study on living tissues & earth's crust:- [Pg-142.E]
	A) Same; absolute B) Different; absolute
	C) Different; same D) Same; relative
PAR	AGRAPH – 9.1 HOW TO ANALYSE CHEMICAL COMPOSITION?
3.	With respect to other elements which element is relatively abundant in living organism than in earth's
	$C^{\text{rust:-}}_{\text{rust:-}} Pg-143, E $
4.	For the chemical composition analysis is used:- IPg-142.M
	A) $CH3COOH$ B) $CH3COOH - Cl$
	C) $Cl_3 - CCOOH$ D) $Cl_3 - COOH$
5.	Filtrate obtained after grinding of living tissue is also known as:- [Pg-142,M]
	A) Slurry B) Acid - soluble
<i>c</i>	C) Acid insoluble pool D) All
6.	Acid – insoluble pool is also known as:- $[Pg-142,E]$
7	A) Slurry B) Retentate C) filtrate D) All Analytical techniques applied to the compound gives us an idea of: IPg 143 F
/.	A) Probable structure of compounds
	B) Molecular formula of compounds.
	C) Both
	D) None
8.	All the carbon compounds that we get from the living tissue can be called:- [Pg-143,E]
0	A) Biomolecules B) Slurry C) Retentate D) All
9.	If the tissue is fully burnt:- $[Pg-143,E]$
	A) All the carbon compounds are oxidised to gaseous forms (CO2 & water vapour). B) Remaining's are known as ash
	C) Ash contains inorganic elements & inorganic compounds
	D) All
10.	Inorganic elements like sulphate and phosphates are present in [Pg-143,M]
	A) Ash of burnt tissue B) Oxidised gaseous form
	C) Both D) None
11.	α – Amino acids are organic compounds containing [Pg-143,M]
	A) Amino group and acidic group substituted on different carbon.
	G) Amino group & nyurogen on amerent carbon.
	D) Keto – group & alcohol group substituted on same carbon.
12.	How many substituted groups are present in an α – amino acid [Pg-143,M]

	A) 1 B) 2 C) 3	D) 4
13.	The R – group in a proteinaceous amino	acid could be [Pg-144,E]
	A) Hydrogen B) M	Aethyl group
	C) Hydroxy methyl D) A	Any of the above
14.	The chemical and physical properties of an	nino acids are essentially of the [Pg-144,E]
	A) Amino group B) G	Carboxyl group
	C) The R - group D) A	All of the above
15.	If the R – group of amino acid is methyl [I	Pg-144,E]
	A) Glycine B) Serine C) Alanine	D) Any of the above
16.	A hydrogen substituted carbon containing a	mino acid is :- [Pg-144,E]
	A) Glycine B) Alanine C) Both (A)	(B) (B) D) Serine
17.	Number of Amino ; Carboxyl & the R – fu	nctional group determines:- [Pg-144,M]
	A) Acidic nature of Amino acid. B) H	Basic nature of Amino acid
	C) Neutral nature of Amino acid D) A	Any of the above
18	Which of the following group of amino aci	f is aromatic in nature:- [Pg-144 M]
10.	A) tyrosine: phenylalanine	
	B) tyrosine: tryptophan glutamic acid	
	C) Glutamic acid: lysine: valine	
	D) none of the above	
19.	Which of the following is neutral in nature:	- [Pg-144.E]
	A) Valine B) Serine C) Alanine	D) All
20.	A particular property of amino acid is the i	onizable nature of [Pg-144,m]
	A) -H B) –NH2 C) CH3	D) All
21.	Which of the following determines the part	icular property of amino acid is the Ionizable nature &
	structure of amino acid:- [Pg-144,M]	
	A) <u>–NH2 & -COOH</u> B) –	COOH only
	C) <mark>–N</mark> H2 only D) r	one of the above
22.	In different solution; of different the	of amino acid changes. [Pg-144,E]
	A) pH; pH B) p	H; structure
	C) Structure; Structure D) s	tructure; pH
23.	Which of the following is a zwitterionic for	m. [Pg-144,E]
	H ⁺ ₃ N-CH-COOH	$H_3^+N-CH-COO$
	$(A) \qquad \mathbf{R} \qquad (B)$	Ŕ
	H _o N-CH-COO	
	(C) R (D)	All of the above
24.	Lipids are generally insoluble:- [Pg	-144,E]
	A) fat B) water	C) Lipid D) All
25.	Lipids could be a fatty acids or has	a group attached to an R – group. [Pg-144,M]
	A) Carboxyl; fatty acid	
	B) Fatty acid; simple	
	C) Carboxyl; simple	
	D) Simple; carboxyl	
26.	The R – group attached to the carboxyl gro	up in a lipid could be a [Pg-144,E]
27	A) $-CH3$ B) $-C2H5$ C) Higher r	umber of $-CH2$ D) All of the above
27.	Palmitic acid has number of carbo	ons including carboxyl carbon. [Pg-144,E]
20	A) 10 B) 15 C) 14 Arachidania acid has mumber of a	D) 12 orbon atoms including the carboxyl [Dr 144 F]
<i>2</i> ð.	An actinuous action has 16 mumber of c	aroon atoms including the cardoxyi [rg-144,E]
20	Fatty acids could be (with double	bonds) or (without double bonds) IDg 144 MI
29.	A) Saturated: Unsaturated	
	R) Unsaturated: Saturated	
	C) Saturated: Saturated	
	C) Saturated, Saturated	





	Water	70 90
	i)	10 15
	I) ii)	10 - 15
	II) Linida	5 :::)
	Lipius	111) 5 7
	IV) Iona	5 - / 1
	$\begin{array}{c} \text{IOHS} \\ \textbf{A} \end{pmatrix} \vdots \\ \Box \text{matching} \end{array}$	1
	A) i) \Box protein	
	11) \Box carbonydrate	
	$111) \sqcup 2$	
	$1V) \sqcup $ Nucleic acid	
	B) 1) \Box carbohydrate	
	11) □Nucleic acid	
	111) 🗆 2	
	(iv) Protein	
	C) i) 🗆 Nucleic acid	
	ii) □Protein	
	iii) 🗆 2	
	iv) 🗆 Carbohydrate	
	D) i) 🗌 Nucleic acid	
	ii) carbohydrate	
	111) 🗋 2	
	ıv) 🗋 Protein	
PAR	AGRAPH – 9.4 PROT	TEINS
52.	Proteins are:- [Pg-147.	E
	A) Polypeptides	
	B) Linear chains of am	nino acid linked by peptide bonds
	C) Polymer of amino a	cids
	D) All of them.	
53.	A protein if a heteropo	lymer:- [Pg-147.M]
	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 inc	orrect:- [Pg-147,H]
	A) homopolymers hav	e 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 acie	ds are synthesized in our body.
55.	What are functions of	proteins:- [Pg-147,M]
	i) Carry out many func	tions in living organism
	ii) Transporter of nutri	ents
	iii) Fight infections	
	iv) Regulates in the for	rm of hormones & enzymes
	A) only two	B) only three C) Only four D) None
56.	The most abundant enz	zyme in animal world isi) while in whole of the biosphere is
	ii)[Pg-147,14	8,M]
	A) (i) Collagen	(ii) PEPcase
	B) (i) RuBisCo	(ii) PEPcase
	C) (i) Collagen	(ii) RuBisCO
	D) None of them	
PAR	RAGRAPH – 9.5 POLY	SACCHARIDE
57.	Polysaccharide is the	part of[Pg-149,M]
	A) $\ln -$ soluble fraction	1
	B) Insoluble pellet	

	C) Retentate			
	D) All			
58.	A polysaccharide contains [Pg-148,E]			
	A) Different Monosacharides			
	B) Same type of monosaccharide			
	C) like cellulose			
	D) All of these			
59.	Cellulose and starch is a homopolymer of [Pg- 149.M]			
	A) Glucose B) Fructose B) Galactose D) None			
	, , , , , , , , , , , , , , , , , , , ,			
60.	Which of the following statement is incorrect :- [Pg- 148,H]			
	A) starch is a a polysaccharide homopolymer.			
	B) Inulin is a polymer of fructose			
	C) In a polysaccharide chain, Right end is reducing while left end is non –re	educing.		
	D) Starch forms helical secondary structures.			
61.	(I) Starch produces blue colour after binding with I2 [Pg- 149,H]			
	(II) Cellulose cannot hold I2			
	A) Both are wrong			
	B) Both are correct			
	C) (I) is correct (II) is incorrect			
	D) (II) is correct (I) is incorrect			
62.	Pap <mark>er made from plant pulp and cotton fibre is [Pg- 149,M]</mark>			
	A) Starch only			
	B) Cellulose			
	C) Complex polysaccharide			
	D) Both (B) & (C)			
63.	What are examples of homopolymers:- [Pg- 149,M]			
A) N – acetyl galactosamine; Glucosamine				
	B) Amino acids; sugars			
	C) Chitin			
	D) None			
PAR	RAGRAPH – 9.6 NUCLEIC ACIDS			
64.	Nucleic acids are:- [Pg- 149,E]			
	A) Polynucleosides B) Polynucleotides C) Both	D) None		
65.	A nucleotide has chemical distinct compounds:- [Pg- 149,E]			
	A) Only one B) Two C) Three	D) Four		
66.	A heterocyclic compound in Nucleic acid is :- [Pg- 149,E]			
	A) N2 – Base B) Sugar C) Fatty acid	D) All		
67.	Adenine and are purines [Pg- 149,M]			
	A) Cytosine; Substituted			
	B) Guanine; Substituted			
	C) Uracil; Substituted			
	D) Guanine; Unsubstituted			
68.	The sugar found in polynucleotides is either ribose () or	[Pg- 149,M]		
	A) 2' deoxyribose; monosaccharide B) Monosaccharide; 2' deoxyribose			
	C) Disaccharide; 2' deoxyribose D) Disaccharide; Monosaccheride			
PAR	AGRAPH – 9.7 STRUCTURE OF PROTEINS			
69.	In a protein the left end represents:- [Pg- 149,150,E]			
	A) First amino acid & C – terminal			
	B) Last amino acid &N – terminal			
1	C) First amino acid & N – terminal			
1	D) Last amino acid & C – terminal			
70.	In a protein the right end represents [Pg- 149,150,E]			
1	A) First amino acid & C – terminal			
1	B) Last amino acid &N – terminal			
1				



1			
	A) H – bond B) S – bond	C) Peptide Bo	nd D) Glycoside bond
81.	Dehydration is cause of formation of –	[Pg- 151,M]	
	A) Peptide bond B)Glyce	osidic bond	
	C) Both A & B D) Non	e of these	
82.	Glycosidic bond is formed between mo	nosaccharide while li	nking-[Pg- 151,M]
	A) Carbon & Carbon B) Carb	oxyl & amino group	
	, , ,	5 6 1	
	C) Carbon & Hydrogen D) Carb	oon & Oxygen	
83.	Match the Column- I & column – II	[Pg- 151,H]	
	Bond	Occurrence	
	(Column- I)	Column – II	
	a. Peptide bond (i) Between Nit	trogenous bases of nu	cleic acid
	b. Glycosidic bond (ii) Between ad	ljacent amino acid	
	c. Ester bond (iii) Between pl	hosphate & hydroxyl	group of sugar
	d. H – Bond (iv) Between ad	djacent carb <mark>on of</mark> mor	nosaccharide
	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 – [Pg-1]	51,M]	
	A) 3' carbon of both sugar of succeedir	ng sugar	
	B) 3' carbon of one sugar & 5' carbon	of the other sugar of s	ucceeding nucleotide
	C) 5' carbon of one sugar of succeeding	g sugar.	
	D) 5' carbon of one sugar & 3' carbon	of other group of succ	ceeding nucleotide.
85.	What is / are number of ester bond & p	hosphodiester bond ei	ither side of nucleic acid respectively- [Pg-]
	151.MI		
	A) 1, 2 B) 1, 1	C) 2. 1	D) 2, 2
86.	The famous Watson – crick model is re	lated to- [Pg- 151.E]	
	A) Nucleic acid (DNA)	B) Protein	
	C) Carbohydrate	D) Enzymes	
87.	How many of following is / are correct	with respect to Watso	on – crick model. [Pg- 151.H]
	i) DNA exist as a double helix	1	
	ii) The strands of polynucleotides are an	ntiparallel.	
	iii) Backbone is formed by sugar only.	1	
	iv) Nitrogen bases faces inside		
	,		
	v) A of one strand bound with U on oth	er strand	
	A) 2 B) 3	C) 4	D) All fives
88.	Choose the correct nitrogen base pairin	g of DNA [Pg- 152,E	
	A) $A \equiv T$ B) $A = U$	C) A = T	$D) A \equiv 0$
89.	Each step of ascent is represented by he	ow many pairs of base	es according to Watson – crick model. [Pg-
	152,E]		
	A) 1 B) 2	C) Zero	D) None of these
90.	At each of ascent, the strand turn[P	Pg- 152,E]	D) 2 40
	A) 63° B) 36°	C) 34°	D) 3.4°
91.	One full turn of helix strand of B –DNA	A involves how many	nitrogen bases [Pg-152,E]
	A) 10 B) 20	C) 2	D) none of these
92.	Choose correct statement regarding B –	-DNA [Pg- 152,H]	
	A) Pitch would be 36 A°		
	B) The rise per base pair would be 3.4A	I_{0}	
	C) Pitch would be 3.4A°	0	
0.2	D) The rise per base pair would be 36A		
93.	Cytosine (C) bond withby	_ H –Bond. [Pg- 152,]	E]
	A) Guanine (G); 2 B) Thy	mine; 2	
	C) Guanine (G); 3 D) Thy	mine; 3	

PAR	RAGRAPH – 9.9 DYNAMIC STATE OF BODY CONSTITUENT'S CONCEPT OF					
ME	METABOLISM					
94.	What is 'turn over'? [Pg- 152,E]					
	A) Biomolecules are ne	ver being changed int	to some other biomolec	cules and also made f	rom some other	
	biomolecules.				1 0	
	B) Biomolecules are co	nstantly being change	ed into some other bion	nolecules but never m	hade from	
	some other biomolecule	≥S.	(1 1 1 1		C	
	C) Biomolecules are ne	ver being changed int	to some other biomolec	cules nor being made	from	
	some other biomolecules.					
	D) Biomolecules are constantly being changed into some other biomolecules and also made from				ade from	
95	The breaking & making	through chemical re-	action which occur con	stantly in living orga	nism are called	
<i>JJ</i> .	$[P\sigma_{-} 152 M]$, unough cheimear rea	action which occur con	istantiy in nying orga		
	(152,01) A) Metabolism	B) Anabolism				
	C) Catabolism	D) none of these				
96	Amine are formed by-	[Pg- 152.M]				
<i>y</i> 0.	A) removal of (-COOH) from amino acid				
	B) removal of (CO2) fr	om amino acid				
	C) addition of $(CO2)$ to	amino acid				
	D) addition of (COOH)	to amino acid				
97.	Metabolites are convert	ed into each other in	a serie <mark>s of linked reacti</mark>	ons called .	[Pg- 152,M]	
	A) Catabolic pathway of	only				
	B) Anabolic pathway o	nly				
	C) Metabolic pathway					
	D) None of these					
98.	Metabolic pathway are-	· [Pg- 152,E]				
	A) Linear only					
B) Circular only						
C) May be linear or circular						
	D) N <mark>one</mark> of them					
99.	How many uncatalysed	metabolic conversion	n is / are found in living	g system [Pg- 152,E]		
	A) 1	1 400				
	B) More than 1 but less than 100					
	C) Zero					
	D) I nousand					
	AGKAPH = 9.10	LIVINC				
100	ADULIC DASIS FUR					
100.	Metabolic pathway that	lead to a more comp	lay structure from a sin	onles structure is / or	ο [P σ 153 M]	
	Metabolic pathway that A) Anabolic pathway	lead to a more compl	lex structure from a sin	nples structure is / are	e [Pg- 153,M]	
	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway	lead to a more comp	lex structure from a sin	nples structure is / are	e [Pg- 153,M]	
	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B	lead to a more comp	lex structure from a sin	nples structure is / are	e [Pg- 153,M]	
	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these	e lead to a more comp	lex structure from a sin	nples structure is / are	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about	t lead to a more comp	lex structure from a sin	nples structure is / are	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about i) Metabolic pathway th	t lead to a more comp ut catabolic pathway at lead to simpler stru	lex structure from a sin Pg- 153,H] acture from a complex	nples structure is / are structure.	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lad	t lead to a more comp ut catabolic pathway [nat lead to simpler stru- tic acid in our skeleta	lex structure from a sin Pg- 153,H] acture from a complex al muscles	nples structure is / are	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become	t lead to a more comp ut catabolic pathway nat lead to simpler stru- tic acid in our skeleta s cholesterol.	Pg- 153,H] Icture from a complex al muscles	nples structure is / are	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway	t lead to a more comp ut catabolic pathway nat lead to simpler stru- ctic acid in our skeleta s cholesterol. that lead to more com	Pg- 153,H] Icture from a complex Il muscles plex structure from a s	aples structure is / are structure. impler structure.	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii	t lead to a more comp ut catabolic pathway nat lead to simpler stru- tic acid in our skeleta s cholesterol. that lead to more com B) i & ii	Pg- 153,H] Incture from a complex al muscles plex structure from a s C) iv & ii	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii	t lead to a more comp ut catabolic pathway [nat lead to simpler stru- ctic acid in our skeleta s cholesterol. that lead to more com B) i & ii	Pg- 153,H] Incture from a complex al muscles plex structure from a s C) iv & ii	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101. 102.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii Which of following exp	ut catabolic pathway nat lead to simpler structic acid in our skeleta s cholesterol. that lead to more com B) i & ii	Pg- 153,H] acture from a complex al muscles plex structure from a s C) iv & ii y? [Pg- 153,H]	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101. 102.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii Which of following exp i) When glucose is degr ii) Assembly of protein	ut catabolic pathway nat lead to simpler structic acid in our skeleta s cholesterol. that lead to more com B) i & ii pect to consume energy raded to lactic acid from amino acid	Pg- 153,H] Incture from a complex al muscles plex structure from a s C) iv & ii y? [Pg- 153,H]	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101. 102.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct abou i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii Which of following exp i) When glucose is degr ii) Assembly of protein iii) Anabolic pathway	ut catabolic pathway nat lead to simpler structic acid in our skeleta s cholesterol. that lead to more com B) i & ii pect to consume energe raded to lactic acid from amino acid	Pg- 153,H] acture from a complex al muscles plex structure from a s C) iv & ii y? [Pg- 153,H]	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101. 102.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii Which of following exp i) When glucose is degr ii) Assembly of protein iii) Anabolic pathway iv) Catabolic pathway	t lead to a more comp ut catabolic pathway nat lead to simpler stru- ctic acid in our skeleta s cholesterol. that lead to more com B) i & ii pect to consume energ raded to lactic acid from amino acid	Pg- 153,H] acture from a complex al muscles plex structure from a s C) iv & ii y? [Pg- 153,H]	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	
101.	Metabolic pathway that A) Anabolic pathway B) Catabolic pathway C) Both A & B D) None of these Choose the correct about i) Metabolic pathway th ii) Glucose becomes lac iii) Acetic acid become iv) Metabolic pathway A) i & iii Which of following exp i) When glucose is degr ii) Assembly of protein iii) Anabolic pathway iv) Catabolic pathway A) i & iii	ut catabolic pathway nat lead to simpler structic acid in our skeleta s cholesterol. that lead to more com B) i & ii pect to consume energ caded to lactic acid from amino acid	Pg- 153,H] Incture from a complex al muscles plex structure from a s C) iv & ii y? [Pg- 153,H] B) ii & iii	nples structure is / are structure. impler structure. D) iv & iii	e [Pg- 153,M]	

103.	How many of following is /are correct about glycolysis [Pg- 153,H]				
	i) Formation of glucose from lactic acid				
	ii) Occur in ten(10) metabolic step.				
	iii) Energy liberated during degradation is store in 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 –[Pg- 153,E]				
	A) Adenosine triphosphate B) Glucose				
	C) Protein D) Enzyme				
105.	Bioenergetics deals with- [Pg- 153,M]				
	A) How do living organism derive their energy				
	B) How do living organism store energy & in what form.				
	C) How do living organism convert energy into work.				
	D) All of these				
PAR	AGRAPH – 9.11 THE LIVING STATE				
106.	The blood concentration of glucose in normal healthy individuals is [Pg- 153,E]				
	A) Less than 2.4 mmol/L				
	B) More than 10 mmol/L				
	C) $4.2 \text{ mmol/L} - 5.0 \text{ mmol/L}$				
	D) None of these				
107.	Living state is $-[Pg-153,M]$				
	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.				
100	D) Non – equilibrium steady – state to be able to perform work.				
108.	Living process is a constant effort to prevent failing into equilibrium. This is achieved by $-$ [Pg-155]				
	C) Both of these D) None of these				
PAR	ACRAPH - 9 12 ENZYMES				
109	Enzymes are chemically $-$ [Pg- 154 E]				
1051	A) Protein B) Carbohydrate C) Lipid D) Nucleic acid				
110.	Ribozymes are chemically [Pg- 154.M]				
	A) Protein B) Lipid C) Carbohydrate D) Nucleic acid				
111.	What is / are difference between inorganic catalyst and enzyme catalyst. [Pg- 154,H]				
	A) inorganic catalysts work efficiently at low temperature but enzyme of only thermophilic organism				
	work efficiently at low temperature				
	B) Inorganic catalyst work efficiently at high temperature but enzyme get damaged at high temperature				
	except of microbes that are live in 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 correct regarding "active site" [Pg- 154,M]				
	1) Substrate fits				
	2) Enzymes catalyst through active site show low rate				
	3) It forms by crevices or pocket made by primary protein only.				
	4) It form by crevices or pocket made by tertiary protein structure				
DAD	A) $1, 2, 3$ B) $1, 2, 4$ C) $1, 3$ D) $1, 4$				
PAR	AGRAPH – 9.12.1 CHEMICAL KEACTION				
115.	A) Change in shore without breaking hands				
	A) Change in shape without breaking bonds. D) Change in state of motter				
	$C) \text{ Ice } \square \text{ water } \square \text{ water variable}$				
	D) All of these $(a + b) = b + b + b + b + b + b + b + b + b + b$				
114.	Chemical change differ from physical change in [Pg- 154,M]				

	B) Formation of new bond
	C) A & B bond
	D) There is no difference in both
115.	Hydrolysis of starch into glucose is :- [Pg- 154,M]
	A) Inorganic chemical reaction
	B) Organic chemical reaction
	C) Physical changes
	D) A & B both
116.	Rate of physical or chemical process refer to $-$ [Pg- 154,M]
110.	A) Amount of reactant formed per unit time
	B) Amount to product dissociate per unit time
	C) Differential of time with respect to produce
	D) Differential of product with respect to time
117	Choose the correct [Pg- 154 H]
11/.	A) Rate can be called velocity if the direction is not specific
	R) Rate of physical & chemical processes are not influenced by temperature
	C) Catalysed reaction proceeds at rates yastly lower than that of uncatalyzed ones
	D) Catalysed reaction proceeds at rates vasily lower than that of uncatalyzed ones.
118	Choose the correct response Pg , 154 H
110.	A) For every increase by 10°C, rate is double
	A) For every increase by 10 C, rate is double
	C) When any was actalyzed reaction are absorved the rate would be yestly lower than the same but
	uportalized reaction
	D) None of these
110	Change compart regrange with regract to given equation: IBg. 155 III
119.	Choose correct response with respect to given equation:- [Pg-155,H]
	Carbon dioxide + water \equiv carbonic acid
	A) Carbonic annydrase is enzyme required for accelerated reaction.
	B) In absence of enzyme, still this reaction is fast enough
	C) 200 molecules of H2CO3 being per hour formed by enzyme accelerated reaction.
100	D) 600,000 molecules of H2CO3 being formed every second in absence of any enzyme.
120.	Which of the following is correct chemical formula for pyruvic acid? [Pg-155,E]
101	A) C2H3O4 B) C3H3O3 C) C3H4O3 D) C6H12O6
121.	Match column – I and column – II [Pg- 155,M]
	Column – I(Metabolic pathway) Column – II (Occurrence)
	A. Formation of alcohol (1) Anaerobic condition of skeletal muscle
	B. Formation of pyruvic acid (ii) Yeast
	C. Formation of lactic acid (111) 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
PAR	AGRAPH – 9.12.2 HOW DO ENZYMES BEING ABOUT SUCH HIGH
RAT	'ES OF CHEMICAL CONVERSIONS?
122.	Which of the following is correct about enzymes [Pg- 155,M]
	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 – [Pg- 155,M]
	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 [Pg- 155,156,M]
	A) Enzyme B) Product C) Reactant D) Intermediate structural states.

A) Dissociation of bond



		C) Substrate conditions		
	120	D) All of these		
	132.	Enzyme activity decline- [Pg-15/,H]		. 1
		A) Above the optimum value	B) Below the	e optimum value
	122	C) A & B both	D) Enzyme a	activity never decline
	133.	Optimum pH refer to – [Pg-157,E]		
		A) pH at which enzyme activity is low	est	
		B) pH at which enzyme activity is high	iest	
		C) pH at which enzyme activity started	immediately	
	124	D) pH at which enzyme activity ended	completely	m
	134.	choose response with respect to enzym	ie activities [Pg-15/,	пј
		i) low temperature destroy enzyme		ine state
		ii) ingli temperature preserve enzyme i	n a temporarity mact	ive state
		iii) As temperature increases engume a	e at which enzyme a	entimum and thereafter increase in
		tomperature load to dealing in anyuma	activities	optimum and thereafter increase in
		x A s temperature increase enzyme	ivition in zoro until o	ntimum tomporatura & thereafter increase
		in temperature lead to increase in enzy	me activities	printum temperature & thereafter mercase
		A) i jij iv B) ij v C) i jv	D iii	iv
	135	As nH increase enzyme activity- [Pg-	, v D) m 157 MI	, 1
	155.	A) Constantly increase	137,111	
		B) Constantly decrease		
		C) No effect		
		D) Increase until optimum and decreas	e further pH	
	136.	With increase in substrate concentration	on, the velocity of the	enzymatic reaction – [Pg-158.H]
		A) Constantly increase		[2] [2] [2] [2] [2] [2] [2] [2] [2] [2]
		B) Rise at first until Vmax and further	no rise	
		C) No effect		
		D) Decrease first until Vmax and incre	ease further	
	137.	After reaching Vmax, the enzymatic re	eaction does not exce	ed by any further rise in concentration of
		substr <mark>ate</mark> because- [Pg-158,H]		
		A) Enzymes molecules are fewer than	substrate molecules	
		B) After saturation of those enzyme m	olecules these are no	free enzyme molecules to bind with additional
		substrate molecules		
		C) A & B		
		D) After saturation of those enzyme m	olecules, enzyme get	changed in it's form.
	138.	When the binding chemical shut off en	zyme activity, the pr	ocess is called and the chemical is
		called [Pg-158,M]	D) I 1 1 1	
		A) Inhibition; inhibitor	B) Inhibition; cofact	ors
	120	C) Exhibition, exhibitor	D) None of these	Dg 159 MI
	139.	A) It fasten enzyme kinetics	B) It decline enzyme	ig-130, wij
		C) It shut off enzyme kinetics	D) No effect on enzy	when the time time time time time time time tim
	140	Inhibition of succinic dehydrogenase h	D is due to	[Pσ_158 M]
	1 10.	A) Malonate closely resembles with su	bstrate succinate in s	structure
		B) Malonate is competitive inhibitor		
		C) It binds with active site of succinic	dehydrogenase in pla	ace of substrate
		D) All of these	aony arogenase in pr	
	141.	Competitive inhibitors are often used i	n the control of $-$ [P.	2-158.MI
		A) Viral pathogen	B) Bacterial pathoge	en
		C) Both A & B	D) None of these	
	PAR	AGRAPH – 9.12.5 CLASSIFICATIO	N & NOMENCLA	TURE OF ENZYME
	142.	Enzyme are divided into how many cla	asses- [Pg-158,E]	
		A) 2 B) 4	C) 6	D) 8
1				

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143.	3. Each classes of enzyme were further classification	on into subclass and named by digit [Pg-
	158,M]	
	A) 13; 4 – 13 B) 4 – 13; 13 C) 4 – 13;	; 4 D) 4; 4 – 13
144.	4. S reduced + S' oxidised \rightarrow S oxidised + S' reduc	ced [Pg-158,M]
	A) Oxidoreductase B) Dehydr	rogenase
	C) Transferase D) A & B	3 both
145.	5. Enzyme catalysing a transfer of a group i.e. hydro	ogen between pair of substrate S and S' is- [Pg-158,M]
	A) Transferase B) Oxidoreductase C) Lyases	s D) Ligases
146.	6. Transferase enzyme catalyse a transfer of	
	G between pair substrate S & S'.	
	G is other than $- [Pg-158,E]$	
147	A) Oxygen B) Amino C) Hydrog	gen D) Carbon
14/.	i) Hydrolysis of ester other portide glycosidia	
	i) frydrofysis of ester, enfer, peptide, grycosidic, ii) C C breakdown	
	iii) C - halide breakdown	
	iv) P - N breakdown	
	A) (i) only B) (i) & (ii) only	
	C) (iii) & (iv) only D) D) i, ii, iii & iv	v
148.	8. Lysase catalyse of groups from substra	rates by mechanism other than hydrolysis leaving
	bond. [Pg-158,E]	
	A. Addition ; double B. Removal ; dou	ıble
	C. Addition ; single D. Removal ; tripl	ole
149.	9. Isomerases catalyse inter-conversion of: [Pg-159,	9,E]
	A. Optical isomer B. Geometrical iso	somer
	C. Position isomer D. All of these	
150.	0. Linking of two compound is achived by- [Pg-159	9,M]
1.4.1	A) Lyases B) Transferase C) Ligases	D) Hydrolase
151.	1. Ligase catalyse- [Pg-159,E]	
	A) Joining of C-O	
	B) $Oxidation - reduction of substrate$	
	D) Conversion of optical isomer	
РАБ	ARAGRAPH = 9.12.6 CO-FACTORS	
152	2° Cofactors are: $[Pg-159.M]$	
102.	A) Proteinous part of enzyme	
	B) Non-proteinous part of enzyme	
	C) Bound to substrate	
	D) Bound to enzyme to make enzyme catalyticall	ly retard
153.	3. How many kind of cofactors may be identified-[P	Pg-159,E]
	A) 1 B) 2 C) 3	D) Zero
154.	4. Cofactors are and apoenzyme are	_ part of enzyme. [Pg-159,M]
	A) Protein; protein	
	B) Non-protein; non-protein	
	C) Protein; non-protein	
155	D) Non-protein; protein	ad from other contactors in that they are hound
155.	to appenzyme [Pg_150 M]	ted from other coractors in that they are bound
	A) Organic compound: tightly	
	B) Organic compound: loosely	
	C) Inorganic compound: loosely	
	D) Inorganic compound; tightly	
156.	6. Which of following is/are correct? [Pg-159,H]	
	(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- [Pg-159,E]				
	A) Vitamin niacin B) Vitamin C C) Vitamin D D) Vitamin K				
158.	Full form of NAD is:- [Pg-159,E]				
	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. [Pg-159.H]				
	A) Zinc are found as appenzyme				
	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 found in activity of carboxynentidase? [Pg-159 M]				
100.	A) Only one : between cofactor and side chain at active site				
	B) Two between cofactor and side chain at active site and at to many ; same time form one	or more bond			
	b) Two between coractor and side chain at active site and at to many, same time form one with substrate	of more bond			
	C) Zaro				
	C) Zelo				
161	Eind mismatch IDg 150 III				
101.	Column I				
	(a) Carboxypeptidase (1) Zinc				
	(b) NADP (11) Niacin (11) Niacin				
	(c) Haem (iii) Peroxidase				
	(d) NAD (1v) Zinc				
162.	When cofactor is removed from enzyme ; what effect is observed. [Pg-159,H]				
	A) Catalytic activity lost				
	B) Catalytic activity enhance				
	C) Catalytic activity fix at optimum				
	D) None of these				
	NEET PREVIOUS YEARS QUESTIONS				
		T = 0 / 07			
1.	The two functional groups characteristic of sugars are	[2018]			
	(a) Hydroxyl and methyl (b) Carbonyl and methyl				
	(c) Carbonyl and hydroxyl (d) Carbonyl and phosphate				
2.	Which of the following are not polymeric?	[2017]			
	(a) Proteins (b) Polysaccharides (c) Lipids (d) Nucleic acids				
3	Which one of the following statements is correct with reference to enzymes?	[2017]			
5.	(a) Holoonzuma = A noonzuma + C conzuma = (b) C conzuma = A noonzuma + U				
	(a) Holoenzyme – Apoenzyme – Coenzyme – (b) Coenzyme – Apoenzyme – Ho	noenzyme			
	(c) noioenzyme = Coenzyme + Co-ractor (d) Apoenzyme = Holoenzyme + Coenzy	/me			
4.	A typical fat molecule is made up of	[2016]			
	(a) three glycerol molecules and one fatty acid molecule.				
	(b) one glycerol and three fatty acid molecules.				
	(c) one glycerol and one fatty acid molecule. (d) three glycerol and three fatty acid	d molecules.			

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5.	Which one of the following statements is incorrect ?	[2016]
	(a) Sucrose is a disaccharide. (b) Cellulose is a polysaccharide.	
	(c) Uracil is a pyrimidine. (d) Glycine is a sulphur containing amino acid.	
6.	The amino acid Tryptophan is the precursor for the synthesis of	[2016]
	(a) melatonin and serotonin. (b) thyroxine and triiodothyronine.	
	(c) estrogen and progesterone. (d) cortisol and cortisone.	
7.	Which of the following biomolecules does have phosphodiester bond?	[2015]
	(a) Monosaccharides in a polysaccharide. (b) Amino acids in a polypeptide.	
~	(c) Nucleic acids in a nucleotide. (d) Fatty acids in a diglyceride.	Fe o 4 = 1
8.	Which one of the following statements is incorrect ?	[2015]
	(a) In competitive inhibitor, the inhibitor molecule is not chemically changed by the enzy	me.
	(b) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substra-	te
	(c) The presence of the competitive inhibitor decreases the Km of the enzyme for the subst	rato
	(d) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor	raie.
	complex	1
9.	Which one of the following is a non-reducing carbohydrate?	[2014]
	(a) Maltose (b) Sucrose (c) Lactose (d) Ribose 5 - phosphate	
10.	Select the statement which is not correct with respect to enzyme action.	[2014]
	(a) Substrate binds with enzyme at its active site.	
	(b) Addition of lot of succinate does not reverse the inhibition of succinic dehydrogenase l	зy
	malonate.	
	(c) A non-competitive inhibitor binds the enzyme at a site distinct from that which binds t	he
	substrate.	
	(d) Malonate is a competitive inhibitor of succinic dehydrogenase.	
11.	Which of the following glucose transporters is insulin-dependent? (NEET-2019)	
10	$(1) GLUT I \qquad (2) GLUT II \qquad (3) GLUT III (4) GLUT IV (3) GLUT III (4) GLUT IV (3) GLUT III (4) GLUT IV (3) GLUT IV (3) GLUT III (4) GLUT IV (3) GLUT IV (3) GLUT III (4) GLUT IV (3) GLUT IV (3) GLUT III (4) GLUT IV (3) GLUT IV (3) GLUT III (4) GLUT IV (3) GL$	
12.	Concanavalin A is: $(NEE1-2019)$	
13	Consider the following statements: (5) a fectility (4) a pignetic (NEET_2019)	
15.	(A) Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic gro	01117
	(B) A complete catalytic active enzyme with its bound prosthetic group is called appenzym	ne.
	Select the correct option.	
	(1) Both (A) and (B) are true. (2) (A) is true and (B) is false.	
	(3) Both (A) and (B) are false. (4) (A) is false and (B) is true.	
14.	Which of the following organic compounds is the main constituent of Lecithin?	
	(NEET-2019 ODISS	5A)
	(1) Arachidonic acid (2) Phospholipid (3) Cholesterol (4) Phosphop	rotein
15.	Prosthetic groups differ from co-enzymes in that :- (NEET-2019 ODISS	5A)
	(1) they require metal ions for their activity.	
	(2) they (prosthetic groups) are tightly bound to apoenzymes.	
	(3) their association with appenzymes is transient.	
16	(4) they can serve as co-factors in a number of enzyme-catalyzed reactions.	(10
10.	(1) Sulphur is an integral part of cysteine	J - 19)
	(2) Glycine is an example of lipids	
	(3) Lecithin contains phosphorus atom in its structure	
	(4) Tyrosine possesses aromatic ring in its structure.	
17.	Identify the substances having glycosidic bond and peptide bond, respectively in their	
	structure:	

						(NEE	ET-2020)
	1) Inulin, insulin	2) Chitin, c	nolesterol	3) Gly	cerol, trypsin	4) Cellulose	, lecithin
18.	Match the following	;:				(NE	E T-2020)
	(a) Inhibitor of catal (b) Possess peptide I (c) Cell wall materia (d) Secondary metal Choose the correct o	ytic activity bonds 1 in fungi polite option from tl	ne following:	(i) (ii) (iii) (iv)	Ricin Malonate Chitin Collagen		
19.	(a) (b) 1) (ii) (iii) 3) (iii) (i) Which of th <mark>e fo</mark> llow:	(c) (d) (i) (iv) (iv) (ii) ing statemen	2) 4) ts is correct?	(a) (ii) (iii)	(b) (c) (iv) (iii) (iv) (i)	(d) (i) (ii)	(NEET-2020)
	1) Adenine does not	pair with th	ymine				
	2) Adenine pairs wit	th thymine th	rough two H	-bonds			
	3) Adenine pairs wit	th thymine th	rough one H	-bond			
	4) Adenine pairs wit	th thymine th	rough three I	H-bonds			
20	Which one of the fol	lowing is the	mostabunda	nt protei	n in the anim	als?	(NIFET_2020)
20.	1) Inculin 2) He	nowing is the				(1) Loctin	(INEE1-2020)
01			3) (ollagen		4) Lectin	
21.	Identify the basic an	nino acid froi	n the following	ng	de	(NE)	ET-2020)
	1) Valine 2) Tyro	osine	3) Glu	tamic Ac	id	4) Lysir	ne
22.	Which of the followir	ng are not sec se	ondary metal 2) V	oolites in inblastin	plants?		[NEET-2021]
	3) Rubb <mark>er,</mark> gums		4) M	lorphine,	codeine		
23.	Match List – I with I	List – II					
	List – I		List – II				
	a) Protein	1)	C = C doub	le bonds	1_		
	b) Unsaturated fa	itty acid 11)	Chrosphodie	ster bonc	15		
	d) Polysaccharide	iv)	Pentide hon	de	_		
	a b	c d	reptide bon	lub			
	1) i iv	iii ii					
	2) ii i	iv iii					
	3) iv iii	i ii					
	4) iv i	ii iii				F2	
24.	Identify the incorrec	ct pair	A 1	•		INEE	[1-2021]
	2) Lectins -	- Concadnay	ADI.	111			
	3) Drugs	-	Rici	n			
	4) Alkaloids -	Codeine	Tue:				
25.	Following are the sta	atements wit	h reference to	'lipids'		[NEE	ET-2021]
	a) Lipids having onl	y single bond	ls are called u	insaturate	ed fatty acids		
	b) Lecithin is a phos	pnolipid	1				
	cj minyuroxy propa	uie is giycero	ι.				

	d) Palmitic acid has 20 carbon atoms inc	luding carboxyl carbon.									
	e) Arachidonic acid has 16 carbon atoms.										
	Choose the correct answer from the options given below.										
	1) c and d only 2) b and c only	3) b and e only 4) a and b only									
26.	Read the following statements on lipid	s and find out correct set of statements:	[NEET-2022]								
	a) Lecithin found in the plasma membrane is a glycolipid										
	b) Saturated fatty acids possess one or more $c = c$ bonds										
	c) Gingelly oil has lower melting point, hence remains as oil in winter										
	d) Lipids are generally insoluble in wa	ter but soluble in some organic solvents									
e) When fatty acid is esterified with glycerol, monoglycerides are formed											
	Choose the correct answer from the options given below:										
	1) a, b and c only	2) a, d and e only									
07	3) c, d and e only 4) a, b and d only										
27.	A dehydration reaction links two gluco	dration reaction links two glucose molecules to produce maltose. If the formula for									
	glucose is $C_6 H_{12} O_6$ then what is the fo	[NEET-2022]									
	1) $C_{12}H_{20}O_{10}$ 2) $C_{12}H_{24}O_{12}$	3) $C_{12}H_{22}O_{11}$ 4) $C_{12}H_{24}O_{11}$									
28.	Ma <mark>tch</mark> List-I with List-II		[NEET-2022]								
	Li <mark>st-I</mark>	List-II									
	(B <mark>io</mark> logical Molecules)	(Bio <mark>logical functions)</mark>									
	(<mark>a) G</mark> lycogen	(i) Hormone									
	(<mark>b)</mark> Globulin	(ii) Biocatalyst									
	(<mark>c) S</mark> teroids	(iii) Antibody									
	(<mark>d) T</mark> hrombin	(iv) Storage product									
	Choose the correct answer from the op	tions given below:									
	1) (a) -(iii), (b) -(ii), (c) - (iv), (d) - (i) 2) (a) -(iv), (b) - (ii), (c) - (i), (d) - (iii)										
	3) (a) –(ii), (b) – (iv), (c) – (iii), (d) – (i)	4) (a) –(iv), (b) – (iii), (c) – (i), (d) – (ii)									

NCERT LINE BY LINE QUESTIONS – ANSWERS									
1) C	2) A	3) B	4) C	5) A	6) B	7) C	8) A	9) D	10) C
11) C	12) D	13) D	14) D	15) C	16) A	17) D	18) A	19) A	20) B
21) A	22) B	23) B	24) B	25) D	26) D	27) A	28) B	29) B	30) D
31) C	32) C	33) A	34) D	35) A	36) C	37) D	38) D	39) A	40) B
41) A	42) B	43) B	44) C	45) D	46) C	47) B	48) B	49) A	50) A
51) A	52) D	53) B	54) D	55) C	56) C	57) D	58) D	59) A	60) C
61) B	62) D	63) A	64) B	65) C	66) A	67) B	68) B	69) C	70) D
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) D	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) B	103) B	104) A	105) D	106) D	107) C	108) B	109) A	110) D
111) B	112) D	113) D	114) C	115) A	116) D	117) D	118) A	119) A	120) C
121) D	122) C	123) C	124) D	125) C	126) C	127) B	128) C	129) 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) A	145) A	146) C	147) D	148) B	149) D	150) C
151) A	152) B	153) B	154) D	155) A	156) C	157) A	158) C	159) B	160) B
161) D	162) A								
NEET PREVIOUS YEARS QUESTIONS-ANSWERS									

1) C	2) C	3) A	4) B	5) D	6) A	7) C	8) C	9) B	10) B
11) 4	12) 3	13) 3	14) 2	15) 2	16) 2	17) 1	18) 2	19) 2	20) 3
21) 4	22) 1	23) 4	24) 3	25) 2	26) 3	27) 3	28) 4		

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

- **1. (c)** Sugar is a carbohydrate. These are polyhydroxy aldehyde, ketone or their derivatives, which means they
 - have carb<mark>ony</mark>l and hydroxyl groups in its structure.
- **2.** (c) Nucleic acids are polymers of nucleotides.
 - Proteins are polymers of amino acids.
 - Polysaccharides are polymers of monosaccharides.
 - Lipids are the tri-esters of fatty acids with glycerol.
- **3. (a)** Holoenzyme is conjugated enzyme which consists of a protein part called apoenzyme and a non-protein called cofactor. Coenzyme are also organic compounds but their association with apoenzyme is only transient and acts as cofactors.
- 4. (b)
- **5. (d)** Glycine (abbreviated as Gly or G) is the smallest of the 20 amino acids commonly found in proteins, and indeed is the smallest possible (having a hydrogen substituent as its side-chain). The formula is NH2CH2COOH. Its codons are GGU, GGC, GGA, GGG of the genetic code
- 6. (a)
- 7. (c) Nucleic acids have phosphodiester bond in a nucleotide.
- **8. (c)** Km increases but Vmax remains the same in competitive inhibition. This is because, on slightly increasing the substrate concentration, the effect of inhibitor is removed.

- **9. (b)** Sucrose is classified under non reducing sugars because it does not have any free aldehyde or keto group.
- 10. (b) Inhibitions of succinic dehydrogenase by malonate is an example of competitive inhibition. Thus, it is

reversible reaction. On increasing the substrate (succinate) concentration the effect of inhibitor is removed and Vmax remain same.

- 17. Inulin is polymer of fructose, these sugars linked by glycosidic bond Insulin is polymer of amino acids, these amino acids linked by peptide bond
- 18. (a) Malonate is competitive inhibitor of enzyme succinic dehydrogenese enzyme
 (b) Collagen is most abundant animal protein. Amino acids of these proteins are linked by peptide bonds
 - (c) Chitin is cell wall material in fungi
 - (d) Ricin is a secondary metabolite
- 19. Adenine pairs with thymine through two H-bonds, guanine pairs with cytosine with 3 hydrogen bonds in a DNA molecule
- 20. The most abundant protein in animals is collagen
- 21. Ly<mark>sin</mark>e is basic amino acid
- 22. A<mark>mi</mark>no acids, glucose
- In a polypeptide or a protein, amino acids are linked by a peptide bond which is formed when the carboxyl (-COOH) group of one amino acid reacts with amino (-NH₂) group of the next amino acid with the elimination of a water moiety.
 - Unsaturated fatty acids are with one or more C = C double bonds.

• In nucleic acids, a phosphate moiety links the 3'-carbon of one sugar of one nucleotide to the 5'-carbon of the sugar of the succeeding nucleotide. The bond between the phosphate and hydroxyl group is an ester bond. As there is one such ester bond on either side, it is called phosphodiester bond.

• In a polysaccharide, the individual monosaccharides are linked by a glycosidic bond

24 Option (3) is incorrect because ricin is a toxin obtained from Ricinus plant. Vinblastin and curcumin are drugs.

*Morphine and codeine are alkaloids.

- * Abrin is also a toxin obtained by plant Abrus.
- * Concanavalin A is a lectin.

25. * The correct option is (2) because lipids having only single bonds are called saturated fatty acids and lipids having one or more C = C double bonds are called unsaturated fatty acids.

- * Palmitic acid has 16 carbon atoms including carboxyl carbon.
- * Arachidonic acid has 20 carbon atoms including the carboxyl carbon.
- * Lecithin is a phospholipid found in cell membrane.
- * Glycerol has 3 carbons, each bearing a hydroxyl (-OH) group.
- 26. Lecithin is a phospholipid and saturated fatty acids do not have c = c bends
- 27. Maltose is a disaccharide formed from two glucose molecules by dehydration
- 28. Glylcogen Storage product

Globulin – Anti body

Steroids - Hormone

Thrombin – Biocatalyst