

Topic :- Biomolecules

- 1 **(b)**
The four main elements found in a living system which make 95% of all elements are
Carbon – 18.5%
Hydrogen – 0.5%
Oxygen – 65%
Nitrogen – 3.3%
These four elements are called 'Big-four' elements
- 2 **(c)**
Proteins are heteropolymers which are made up of 20 types of monomers of amino acids
- 3 **(b)**
Catabolic and anabolic pathways are often coupled in a cell because the free energy released from one pathway is used to drive other pathways
- 4 **(b)**
Proteins are linear polymers of amino acids. Hence, these are made up of C, H, O, N and in some cases S also. These are macromolecules of high molecular weight (from 6000 to several millions). The elimination of water during interaction between the amino acids is called condensation and the linkage so formed is a carbon nitrogen bond called peptide bond. The compound so formed is called dipeptide.
- 5 **(a)**
Trehalose is the major sugar of insect haemolymph, in disaccharide form
- 6 **(d)**
These are five forms of DNA, B.DNA is most common.
A-DNA – 11 pairs
B-DNA – 10 pairs
C-DNA – 9.33 pairs
D-DNA – 8 pairs
Z-DNA – 12 pairs

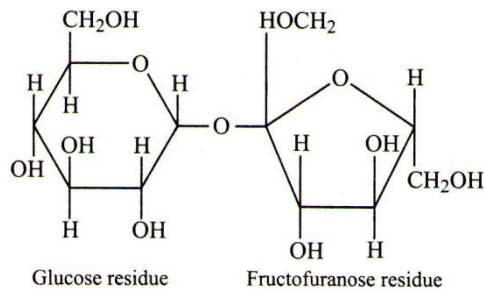
- 7 **(a)**
The phospholipid is a bipolar molecule having long fatty acid called hydrophobic tail (water hating) or non-polar end and hydrophilic (water loving) or polar end, hence it is **amphipathic** in nature.
- 8 **(b)**
$$\text{NADH} + \text{H}^+ + 1/2\text{O}_2 \xrightarrow[\text{oxidase}]{\text{Cytochrome}} \text{NAD}^2 + \text{H}_2\text{O}$$

Cytochrome oxidases catalyses the transfer of hydrogen to oxygen, forming water in the last reaction of electron transport system
- 9 **(a)**
Flow of metabolites through metabolic pathway has a definite rate and direction like automobile traffic. These pathways criss-cross each other
- 10 **(a)**
A peptide bond is a chemical bond formed between two molecules when the carboxyl group of one molecule reacts with the amino group of the other molecule; thereby releasing a molecule of H₂O. This is a dehydration synthesis reaction and usually occurs between amino acids. The resulting bond is a peptide bond and the resulting molecules is an amide.
- 11 **(b)**
In animal tissues, the categories of compounds present are called primary metabolites
- 12 **(c)**
Cellulose is homopolysaccharide, a polymer of β – glucose. The glucose monomers are linked together by β – 1, 4 linkage. Cellulose is the main constituent of plant cell wall.
- 13 **(d)**
The catalysts which hasten the rate of a given metabolic conversation are also proteins. These proteins with catalytic power are named enzymes
- 14 **(d)**
Amylases, glucoamylases and glucoisomerases are all enzymes that convert corn starch into high fructose syrup, which is used to flavour soft drinks and to sweeten biscuits and cakes.
- 15 **(b)**
Denaturation means deviation from natural form. Proteins or nucleic acids whenever exposed to extreme heat, pH or acids their structure become change. This process is known as **denaturation**.

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(c)

Sucrose is a disaccharide, which on hydrolysis breaks down into glucose and fructose.



17

(d)

In Meselson and Stahl's experiment, bacterial cells were grown for several generations in a medium containing a heavy isotope of nitrogen (N^{15}) and then, were transferred to a new medium containing the normal lighter isotope (N^{14}). At various times thereafter, samples of bacteria were collected and their DNA was dissolved in a solution of cesium chloride, which was spun rapidly in a centrifuge. Because the cesium ion is so massive, it tends to settle towards the bottom of the spinning tube, establishing a gradient of caesium density.

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(a)

Protein	Present in
Fibroin	Silk
Albumin	Egg, blood plasma
Keratin	Hair, skin
Globulin	Blood plasma

19

(a)

Inactive form of enzymes is called proenzymes

20

(c)

Among these, glycine is the simplest amino acid.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	b	c	b	b	a	d	a	b	a	a
Q.	11	12	13	14	15	16	17	18	19	20
A.	b	c	d	d	b	c	d	a	a	c

PE