

### Topic :- Biomolecules

- 1 (c)  
A = 1° structure    B = 4° sstructure  
C = 3° structure    D = 2° structure

- 2 (d)  
When we grind a tissue, we are disrupting the cell structure  
Cell membrane and other membranes are broken into pieces and form vesicles which are not water soluble. Therefore, these membrane fragments in the form of vesicles get separated along with the acid insoluble pool and hence, in the macromolecular fraction.  
Lipids are not strictly macromolecules

- 3 (a)  
Silicon is almost negligible in living organism. A comparison of elements present in non-living and living matter is as follows

| Element        | % Weight of Earth's crust Human Body |            |
|----------------|--------------------------------------|------------|
| Hydrogen (H)   | 0.14                                 | 0.5        |
| Carbon (C)     | 0.03                                 | 18.5       |
| Oxygen (O)     | 46.6                                 | 65.0       |
| Nitrogen (N)   | Very little                          | 3.3        |
| Sulphur (S)    | 0.03                                 | 0.3        |
| Sodium (Na)    | 2.8                                  | 0.2        |
| Calcium (Ca)   | 3.6                                  | 1.5        |
| Magnesium (Mg) | 2.1                                  | 0.1        |
| Silicon (Si)   | 27.7                                 | negligible |

\*Adapted from CNR Rao, Understanding Chemistry Universities Press Hyderabad

- 4 (b)  
(i) Carrots – Carotene  
(ii) tomatoes – Lycopene

- 5 (c)  
**Lecithin** is a phospholipid composed of choline and inositol. It is found in all living cells as a major component of cell membrane.

- 6 **(b)**  
The central core of silk fibre is made up of fibroin protein. Silk fibres are soft and flexible. These are composed of  $\beta$ -pleated sheets.
- 7 **(a)**  
Every coenzyme is a cofactor but every cofactor is not coenzyme.
- 8 **(a)**  
The rate of reaction doubles or decreases by half for every  $10^{\circ}\text{C}$  change in either direction
- 9 **(b)**  
Special non-protein molecules are called cofactors. These help enzymes to catalyze chemical reactions. Organic cofactors are called coenzymes.
- 10 **(b)**  
There are 20 different amino acids. In proline and hydroxyl proline instead of  $-\text{NH}_2$  group,  $\text{NH}$  group is present. These are called **imino acids**.  
**Methionine** and **cysteine** are sulphur containing amino acids.
- 11 **(d)**  
The sum total composition of acid soluble and acid insoluble fraction represents the composition of cellular pool
- 12 **(b)**  
**Emil Fisher** (1894) proposed 'lock and key theory' for the mechanism of enzyme action, according to which the active sites of enzyme have a specific geometric shape wherein the substrate molecules fit in just like a key in a particular lock. In other words, it illustrates that a particular enzyme molecule interacts with a specific type of substrate molecule.
- 13 **(b)**  
Acidic amino acids have two carboxyl groups and one amino groups per molecule. They are called monoamino dicarboxylic amino acids. They include aspartic acid and glutamic acid
- 14 **(a)**  
After doing the chemical analysis of organic compounds found in living organisms, two types of organic compounds were observed. There are filtrate (acid soluble pool) and the retentate (acid insoluble pool)

- 15 **(a)**  
**Dehydrogenase** is not an example of hydrolases. It is an example for oxidoreductases.
- 16 **(b)**  
Human skin contains  $\alpha$ -keratin, which is a secondary form of proteins
- 17 **(a)**  
Dynamic state of body constituents
- 18 **(a)**  
 $ADP + P_i \rightarrow ATP$  (endergonic)  
 $ATP \rightarrow ADP + P_i$  (exergonic)
- 19 **(d)**  
In DNA, thymine (5 – methyl uracil) is present. Uracil is present in RNA at the place of thymine.
- 20 **(b)**  
Purine and pyrimidine nitrogenous base are found in DNA. Among purines, adenine pairs only with the pyrimidine thymine. Similarly, guanine pairs with the cytosine. The fact that total amount of purine will be equal to total amount of pyrimidine was first enunciated by Chargaff in 1950. From this law,  
Adenine=Thymine= $60/2=30\%$   
Guanine=Cytosine= $40/2=20\%$

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

**PE**