

**Topic :- Cell the Unit of Life**

- 1 (a)  
According to Watson and Crick's DNA model, DNA exists as double helix in which two polynucleotide chains are coiled about one another in a spiral way (a right handed spiral). The base pairs in DNA are stacked  $3.4\text{\AA}$  apart with 10 base pairs in a turn ( $360^\circ$ ) on the double helix. Therefore, if the length of DNA has 45,000 base pairs, DNA molecule will take 4,500 complete turns.
- 2 (b)  
One turn of helix measures  $34\text{\AA}$ . It contains 10 base pairs placed at regular interval of  $3.4\text{\AA}$ .
- 3 (d)  
Plastids are mainly of two types:  
(i) Coloured (including chromoplasts containing pigments other than chlorophyll and chloroplast containing green pigment chlorophyll).  
(ii) **Leucoplasts**, which store reserve food material, these are devoid of any pigment and may be carbohydrate storing amyloplast, lipid storing elaioplast or protein storing proteinoplast (**aleuroplast**)
- 4 (d)  
The Watson and Crick model shows that DNA is a double helix with deoxyribose sugar-phosphate back bone on the outside and paired bases on the inside. The planes of the bases are perpendicular to the helix axis. The planes of sugars are nearly right angles to those of the bases.
- 5 (c)  
RNA has two purines (adenine and guanine) and two pyrimidines (uracil and cytosine) bases. Thymine is not present in RNA, instead of it, uracil is present.
- 6 (c)  
A-Plasma membrane, B-Interdoublet bridge, C-Central microtubule and D-Radial spoke
- 7 (b)  
The lysosomes are bound by a single unit membrane of  $75\text{\AA}$ . The peroxisomes are also surrounded by a single unit membrane of about  $60\text{\AA}$  thickness. The mitochondria is

surrounded by double layered membrane

8 (c)

Red colour of tomato is due to presence of lycopene pigment.

9 (a)

DNA has deoxyribose pentose sugar and four nitrogenous bases, *i.e.*, adenine (A), guanine (G), both purines and cytosine (C), thymine (T) both pyrimidines. While, RNA has ribose pentose sugar and four nitrogenous bases as in DNA except uracil (U) in place of thymine.

10 (c)

(i) The structure replicates during mitosis and generates the spindle – L

(ii) Major site for synthesis of lipid – B

(iii) Power house of the cell – H

(iv) Store house of digestive enzyme – J

(v) Increase the surface area for the absorption materials – N

(vi) Site of glycolysis – F

(vii) Site for active ribosomal RNA synthesis – D

11 (a)

Cell membrane was discovered by Schwann (1838) but it was named by Nageli and Cramer (1855)

12 (c)

Vacuole is a single membrane bound space in plant cell. It contains cell sap. The cell sap have minerals dissolved in water. It also contains a water soluble pigment anthocyanin. DNA is absent here.

13 (d)

The primary cell wall contains many small openings or pores situated in primary pit fields. The cytoplasm of adjacent cells communicates through the pores by means of cytoplasmic bridges called **plasmodesmata**. The plasmodesmata permit circulation of fluids and passage of solutes between cells.

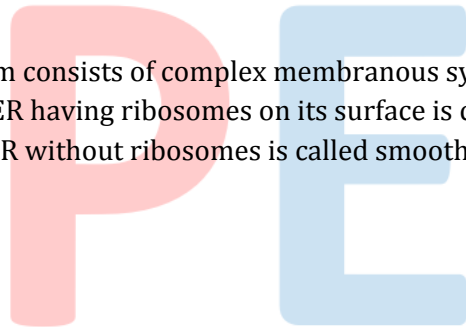
14 (a)

A growing cell undergoes a cell cycle that consist essentially of two periods interphase and mitotic phase. Interphase is the period which cells prepare for cell division by synthesising RNA and protein (in  $G_1$  and  $G_2$  – phase) and DNA (in S – phase). Thus, if cell has twice as much DNA as in a normal functional cell, it means that the cell is preparing to divide.

15 (b)

Within the nucleus, DNA is organised along with proteins into material called **chromatin** and thick condensed chromatin is called chromosome.

- 16 **(d)**  
Ultra violet rays are high energy radiation, which breaks hydrogen bonds between DNA strands.
- 17 **(a)**  
Double membranes are absent in lysosomes. They are enclosed by lipoproteinaceous unit membrane. Lysosome is called 'suicidal bag' of the cell due to presence of hydrolytic enzymes.
- 18 **(d)**  
Plasmodesmata (singular-plasmodesma) are cytoplasmic bridges between adjacent plant cells. Various substances can pass from one cell to another through plasmodesmata. This term is given by Strasburger in 1901.
- 19 **(c)**  
Pilli are not involved in locomotion. Actually, pilli are longer, fewer and thicker tubular outgrowths, which develop in response to  $F^+$  or fertility factor in gram negative bacteria
- 20 **(b)**  
Endoplasmic reticulum consists of complex membranous system in the cytoplasm of eukaryotic cells. The ER having ribosomes on its surface is called **Rough Endoplasmic Reticulum** while the ER without ribosomes is called smooth ER.



<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>a</b>	<b>b</b>	<b>d</b>	<b>d</b>	<b>c</b>	<b>c</b>	<b>b</b>	<b>c</b>	<b>a</b>	<b>c</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>a</b>	<b>c</b>	<b>d</b>	<b>a</b>	<b>b</b>	<b>d</b>	<b>a</b>	<b>d</b>	<b>c</b>	<b>b</b>

**PE**