

Topic :- Cell the Unit of Life

- 1 (a)
Nucleolus is one of the most important site of RNA synthesis. The RNA synthesised by it is rRNA. Which comprises about 80% of total RNA content of the cell.
- 2 (b)
Plasmalemma is also called call membrane or biomembrane that does not contain RNA.
- 3 (a)
A-Telocentric chromosome, B-Acrocentric chromosome, C-Submetacentric chromosome, D-Metacentric chromosome
- 4 (d)
Prokaryotes are generally smaller and differ from eukaryotic cells in terms of structural elements and genetic processes,
e.g., bacteria, blue-green algae, mycoplasma, etc.
Unlike eukaryotes, prokaryotes lack a true nucleus, a nuclear membrane and the membrane bound organelles (mitochondria, chloroplast, Golgi bodies, ER).
Ribosomes are 70 S type in prokaryotes, while it is 80 S in eukaryotes although 70 S type of ribosomes are found in mitochondria and chloroplast of eukaryotic cell.
- 5 (c)
Schleiden (1838) proposed a hypothesis that cell is the structural and functional unit of life.
- 6 (d)
In DNA molecule, instead of **uracil**, **thymine** is present. Uracil is present in RNA molecule.
- 7 (d)
Prosthetic groups are organic compounds and are distinguished from other co-factors (non-protein constituents bound to the enzymes) in that they are tightly bound to the apoenzyme (protein portion of the enzymes). For example, in peroxidase and catalase, which catalyze the breakdown of H_2O_2 to H_2O and O_2 , haeme is the prosthetic group and it is the part of active site of the enzyme.

- 8 **(d)**
Some prokaryotes like photosynthetic bacteria and blue-green algae possess small membrane lined chromatophores, which are similar to but chemically simpler than the chlorophyll of plants.
- 9 **(a)**
Heterogenous nuclear RNA (hn RNA) undergo two additional processing known as **capping** and **tailing**. In **capping** an unusual nucleotide (methyl guanosine triphosphate) is added to the 5' end of hnRNA. In **tailing**, adenylate residues (200-300) are added a 3' end in template independent manner.
In **splicing**, introns are removed and exons are joined in a definite order.
- 10 **(c)**
In prokaryotes, an organelle like the one in eukaryotic cells is ribosomes
- 11 **(c)**
*t*RNA is synthesised in nucleus and transfers to cytoplasm. It keeps up amino acid to its CCA 3' end and transfers it to ribosome during translation process.
- 12 **(b)**
Protoplasm of a cell is called protoplast
- 13 **(a)**
Ribosomes are large non-membranous RNA protein complexes, which are necessary for protein synthesis.
- 14 **(a)**
Structurally, the mitochondria is bounded by two membranes, *i.e.*, the outer and the inner membrane, separated by a space called outer chamber or inter membrane space. The inner membrane is thrown up into a series of folds called cristae.
- 15 **(c)**
Bacterial cell envelope consists of three components glycocalyx, cell wall and cell membrane
Glycocalyx It is the outermost mucilage layer of the cell envelope
Cell Wall It is rigid solid covering, which provides shape and structural support to the cell. Cell wall lies between plasma membrane and glycocalyx
Plasma/Cell Membrane It is selectively permeable covering of the cytoplasm that forms the innermost components of cell envelope
- 16 **(a)**
(i) Ostrich egg – 170 × 150 μm
(ii) Mycoplasma – 01 – 0.5 μm

(iii) Bacteria – 3 - 5 μm

(iv) Human RBCs – 7 μm

So, the arrangement in ascending order is

Mycoplasma → Bacteria → Human RBCs → Ostrich egg

17 **(d)**

A eukaryotic cell is the one which has an organised nucleus and several membrane covered cell organelles.

Except Monera, the cells of all other kingdoms have eukaryotic organization

18 **(a)**

DNA ligase joins DNA fragments.

19 **(b)**

Each species has a characteristic content of DNA, which is constant in all the individuals of that species and has thus been called the **C-value**. Eukaryotes vary greatly in DNA content but always contain much more DNA than prokaryotes. Lower eukaryotes have less DNA such as nematode *Caenorhabditis elegans*, which has only 20 times more DNA than *E. coli* or the *Drosophila*, which has 40 times more DNA (*ie.*, 0.18 μg). Man has about 3.2×10^9 bp of DNA per haploid genome. This huge variation in C-value between species is called **C-value paradox**.

20 **(c)**

In fluid mosaic model of plasma membrane, phospholipids form a bimolecular layer in the middle part.

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

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