BIOLOGY

NEET

CRASH COURSE

CELL: THE UNIT OF LIFE

SMART ACHIEVERS

JEE | NEET | FOUNDATION

587, Nitikhand-1, Indirapuram, Gzb.

7292077839 / 7292047839 | smartachievers.online

A Unit of SMARTACHIEVERS LEARNING Pvt. Ltd., Delhi

CELL: THE UNIT OF LIFE

1. All organisms are made of cells or aggregates of cells. Cells vary in their shape, size and activities/ functions.
2. Based on the presence or absence of a membrane bound nucleus and other organelles, cells and hence organisms can be named as eukaryotic or prokaryotic.
3. A typical eukaryotic cell consists of a cell membrane, nucleus and cytoplasm.
4. Plant cells have a cell wall outside the cell membrane.
5. The plasma membrane is selectively permeable and facilitates transport of several molecules.
6. The endomembrane system includes ER, golgi complex, lysosomes and vacuoles.
7. All the cell organelles perform different but specific functions. Centrosome and centriole form the basal body of cilia and flagella that facilitate locomotion.
8. In animal cells, centrioles also form spindle apparatus during cell division.
9. Nucleus contains nucleoli and chromatin network. It not only controls the activities of organelles but also plays a major role in heredity.
10. Endoplasmic reticulum contains tubules or cisternae. They are of two types: rough and smooth. ER helps in the transport of substances, synthesis of proteins, lipoproteins and glycogen.
11. The golgi body is a membranous organelle composed of flattened sacs. The secretions of cells are packed in them and transported from the cell.
12. Lysosomes are single membrane structures containing enzymes for digestion of all types of macromolecules.
13. Ribosomes are involved in protein synthesis. These occur freely in the cytoplasm or are associated with ER
14. Mitochondria help in oxidative phosphorylation and generation of adenosine triphosphate. They are bound by double membrane; the outer membrane is smooth and inner one folds into several cristae.
15. Plastids are pigment containing organelles found in plant cells only.
16. Chloroplasts are responsible for trapping light energy essential for photosynthesis. The grana, in the plastid, is the site of light reactions and the stroma of dark reactions. The green coloured plastids are chloroplasts, which contain chlorophyll, whereas the other coloured plastids are chromoplasts, which may contain pigments like carotene and xanthophyll.
17. The nucleus is enclosed by nuclear envelop, a double membrane structure with nuclear pores. The inner membrane encloses the nucleoplasm and the chromatin material.
18. Thus, cell is the structural and functional unit of life.

EXERCISE

Q.1 Plasmodesmata are:-
(1) Pores in cell wall (2) Pores in cell membrane
(3) Protoplasmic connections (4) 1 and 2 both

Q.2 Which element mainly occurs in middle lamella:-
(1) Ca (2) Mg (3) Na (4) K

Q.3 Cell wall was discovered by :–
(1) Robert brown (2) Malpighi (3) Robert Hooke (4) Nageli

Q.4 Cell wall is :–
(1) Dead and impermeable (2) Dead and permeable
(3) Living and impermeable (4) Living and selective

Q.5 Carbohydrates are present in the plasmalemma in the form of :–
(1) Hemicellulose (2) Cellulose (3) Starch (4) Glycoprotein

Q.6 Which of following organisms has cell wall ?
(1) *Euglena* (2) *Mucor* (3) *Mycoplasma* (4) *Amoeba*

Q.7 Plasma membrane is fluid structure due to presence of :–
(1) Carbohydrate (2) Lipid (3) Glycoprotein (4) Polysaccharide

Q.8 The chemical substance abundantly present in middle lamella is :–
(1) Cutin (2) Chitin (3) Lignin (4) Pectin

Q.9 The middle lamella is composed of :-
(1) Pectates (2) Cellulose (3) Lignin (4) Proteins

Q.10 Cell wall is present in :-
(1) Plant cells (2) Prokaryotic cell (3) Algal cell (4) All the above

Q.11 Ingestion of large molecules by animal cell is called -
(1) Diffusion (2) Osmosis (3) Exocytosis (4) Endocytosis

Q.12 Endocytosis includes -
(1) Phagocytosis (2) Pinocytosis (3) Both (4) None

Q.13 Which one of the following is not a constituent of cell membrane ?
(1) Cholesterol (2) Glycolipids (3) Proline (4) Phospholipids

Q.14 Mitochondria are also called as:-
(1) Lipochondria (2) Sarcoplasm (3) Chondriosomes (4) Microbodies

Q.15 Besides producing secretory vesicles, the function of golgibody is:-
(1) Lysosome formation (2) Formation of spindle fibers
(3) Formation of E.R. (4) All the above

Q.16 Enzymes for ETS occur in (mitochondria) :-
(1) Matrix (2) Outer wall (3) Inner membrane (4) Between inner & outer wall

Q.17 Mitochondrial DNA is :-
(1) Naked (2) Circular (3) Double stranded (4) All the above

Q.18 Golgibody orginates from :-
(1) E. R. (2) Mitochondria (3) Nucleus (4) Proplastid

Q.19 Which cell organelle synthesises steroids :-
(1) E. R. (2) Golgibody (3) Peroxisomes (4) Lysosomes

Q.20 Which of the following provides mechanical support and shape to the cell :-
(1) Golgi complex (2) Centrioles (3) Lomasomes (4) E.R.

Q.21 Power house of cell is :-
(1) Nucleus (2) DNA (3) Mitochondria (4) ATP

Q.22 Elementary particles of mitochondria are :-
(1) F_1 particles (2) Ribosomes (3) DNA (4) Lysosomes

Q.23 Peptidyl transferase enzyme found on :-
(1) Cytoplasm (2) E.R. (3) Golgibody (4) Ribosomes

Q.24 Semiautonomous cell organelle is :–
(1) Mitochondria (2) Ribosome (3) Plasma membrane (4) Peroxysome

Q.25 In which types of cell lysosomes are abundantly found :–
(1) Storage cell (2) Glandular cell (3) Phagocytic cell (4) Vasicular cell

Q.26 Chemical modification of substance like glycosidation of protein and lipid occur in :–
(1) Endoplasmic reticulum (2) Golgi body
(3) Lysosome (4) Ribosome

Q.27 Which of the following is known as "System of membrane" :–
(1) Lysosome (2) E.R. (3) Mitochondria (4) Chloroplast

Q.28 Oxysome of mitochondria are concerned with :–
(1) Photophosphorylation (2) Oxidative phosphorylation
(3) Photorespiration (4) Digestion

Q.29 Functional unit of protein synthesis is :–
(1) Dictyosome (2) Polysome (3) Peroxisome (4) Lysosome

Q.30 Mitochondria are present in the :–
(1) Aerobic organism only
(2) Obligate anaerobic organism
(3) Aerobic and obligate anaerobic organism
(4) Angiosperm only

Q.31 Mark the lysosomal stabilizer :–
(1) Vitamin–K (2) Vitamin–A (3) Cortisone (4) Progesterone

Q.32 Aerobic respiration is performed by :-
(1) Mitochondria (2) Chloroplast (3) Ribosome (4) Golgibody

Q.33 The stored food and secretory substances found in the cytoplasm makes :-
(1) Cytoplasm (2) Hyaloplasm (3) Protoplasm (4) Deutoplasm

Q.34 Cristae are found in :-
(1) Surface of grana
(2) Surface of plasma membrane.
(3) Wall of Mitochondria
(4) Nuclear Membrane.

Q.35 E.R. is not related with -
(1) Plasmalemma (2) Golgibody (3) Mitochondria (4) Nucleus

Q.36 The main organelle involved in modification and routing of newly synthesized proteins to their destinations is –
(1) Endoplasmic Reticulum
(2) Lysosome
(3) Mitochondria
(4) Chloroplast

Q.37 Which of the following statements regarding mitochondrial membrane is not correct ?
(1) The outer membrane resembles a sieve
(2) The outer membrane is permeable to all kinds of molecules.
(3) The enzymes of the electron transfer chain are embedded in the outer membrane.
(4) The inner membrane is highly convoluted forming a series of infoldings.

Q.38 Polysome is formed by :-
(1) A ribosome with several subunits
(2) Ribosomes attached to each other in a linear arrangement
(3) Several ribosomes attached to a single mRNA
(4) Many ribosomes attached to a strand of endoplasmic reticulum

Q.39 Vacuole in a plant cell :-
(1) Lacks membrane and contains air
(2) Lacks membrane and contains water and excretory substances
(3) Is membrane-bound and contains storage proteins and lipids
(4) is membrane-bound and contains water and excretory substances

Q.40 In germinating seeds fatty acids are degraded exclusively in the:-
(1) Peroxisomes (2) Mitochondria (3) Proplastids (4) Glyoxysomes

Q.41 Keeping in view the fluid mosaic model for the structure of cell membrane, which one of the following statements is correct with respect to the movement of lipids and proteins from one lipid monolayer to the other (described as flipflop movement) ?
(1) While proteins can flip-flop, lipids can not (2) Neither lipids, nor proteins can flip-flop
(3) Both lipids and proteins can flip-flop (4) While lipids can rarely flip–flop,proteins can not

Q.42 Detoxification of lipid soluble drugs and other harmful compounds, in endoplasmic reticulum is carried out by :-
(1) Cytochrome P450 (2) Cytochrome bf (3) Cytochrome c (4) Cytochrome a1-a3

Q.43 Enzymes are synthesized on :-
(1) Dictyosomes (2) Ribosomes (3) Mitochondria (4) None of the above

Q.44 Which is not true about sphaerosomes :-
(1) Involved in photorespiration (2) Arise from E.R.
(3) Related to fat metbolism (4) Single membane bound

Q.45 Elioplasts absent in :-
(1) Potato (2) *Cocos nucifera* (3) *Arachis hypogea* (4) *Helianthus*

Q.46 Glyoxylate pathway takes place in :-
(1) Peroxisomes (2) Sphaerosomes (3) Lysosomes (4) Glyoxysomes

Q.47 Smallest cell organelle is :-
(1) Lysosome (2) Centrosome (3) Ribosome (4) Golgibody

Q.48 Which of following is not common in chloroplasts & mitochondria ?
(1) Both are present in animal cells (2) Both contain their own genetic material
(3) Both are present in eukaryotic cells (4) Both are present in plant cells

Q.49 Which of the following enzymes are found in matrix of peroxisomes :-
(1) NADH cytochrome reductase (2) Glyoxidases and malate dehydrogenase
(3) Acid phosphatases and isocitric lysase (4) Catalases and oxidases

Q.50 Mitoplast is :-
(1) Outer membrane less chloroplast (2) Outer membrane less mitochondria
(3) Granum less chloroplast (4) Well developed nucleus

Q.51 Cilia and flagella both have -
(1) 9 + 2 arrangement of microtubules (2) Protective structure of cells
(3) Only present in protozoa Animals (4) Only outgrowth structure of cytoplasm

Q.52 Centrioles and centrosomes are presente in cells of :-
(1) Animals (2) Bactria (3) Green cells (4) Cyanobacteria

Q.53 Which of the following statements regarding cilia is not correct?
(1) Cilia contain an outer of nine doublet microtubules surrounding two single microtubules.
(2) The organized beating of cilia is controlled by fluxes of Ca2+ across the membrane.
(3) Cilia are hair-like cellular appendages.
(4) Microtubules of cilia are composed of tubulin.

Q.54 Kinetochore is present in :-
(1) Mitochondria (2) Sphaerosome (3) Chromosome (4) Flagella

Q.55 The chromosomes appear as beaded structures at:-
(1) Leptotene (2) Pachytene (3) Diakinesis (4) Telophase–I

Q.56 Nucleus controls the activity of cytoplasm by sending :-
(1) Enzymes (2) cAMP (3) Hormones (4) RNA

Q.57 The protein nucleoplasmin occurs in :-
(1) Nuclear pore complex (2) Sieve cells
(3) Nucleolus (4) Hetero chromatin

Q.58 Nucleosome is made up of :–
(1) Nonhistone protein + RNA (2) Histone protein and DNA
(3) Non–histone and histone protein (4) Phospholipid and protein

Q.59 Chromatin is made up of :–
(1) Nucleoprotein (2) Nucleoside (3) Pentose sugar (4) Nitrogenous base

Q.60 Hetero-chromatin is :-
(1) Darkly stained part of chromatin (2) Lightly stained part of cristae
(3) Lightly stained part of grana (4) Scattered Lobes in cytoplasm

Q.61 Part of Chromosome which joins with spindle fibres is -
(1) Chromatid (2) Chromonema (3) Chromomere (4) Centromere

Q.62 The cells without nuclei are present in :-
(1) Vascular cambium (2) Root hair (3) Companion cell (4) Members of seive tube

Q.63 The telomeres of eukaryotic chromosomes consist of short sequences of –
(1) Cytosine rich repeats (2) Adenine rich repeats
(3) Guanine rich repeats (4) Thymine rich repeats

Q.64 Protein synthesis in an animal cell occurs –
(1) On ribosomes present in cytoplasm as well as in mitochondria
(2) On ribosomes present in the nucleolus as well as in cytoplasm
(3) Only on ribosomes attached to the nuclear envelope and endoplasmic reticulum
(4) Only on the ribosomes present in cytosol

Q.65 Telomerase is an enzyme which is a –
(1) RNA (2) Ribonucleoprotein (3) Repetitive DNA (4) Simple protein

AIIMS Special

Instructions for following questions (Q.66 to Q.75).

(1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
(2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
(3) If Assertion is true statement but Reason is false, then mark (3).
(4) If both Assertion and Reason are false statements, then mark (4).

Q.66 **Assertion :** RBC membrane is highly flexible.
Reason : Amount of external protein in cytoplasmic face of membrane is more.

Q.67 **Assertion :** Lampbrush chromosomes shows transcriptionally active loops.
Reason : Informosomes can be used in future for embryo development.

Q.68 **Assertion :** Centriole does not form any compartment in a cell.
Reason : Centriole is a non-membranous cell organelle.

Q.69 **Assertion :** Janus green B is a vital stain for locating mitochondria.
Reason : Janus green is oxidised by cytochrome a2 present in mitochondria.

Q.70 **Assertion :** Lysosomes help in digestion of foreign particles in the animal cells.
Reason : They have respiratory enzymes.

Q.71 **Assertion :** Chromoplast is coloured plastid in corolla and ripened fruits.
Reason : It has water soluble chlorophyll and carotenoid pigments.

Q.72 **Assertion :** The axoneme of eukaryotic flagellum possesses a number of microtubules running parallel to the long axis.
Reason : It has a pair of peripheral doublet and a pair of centrally located microtubules.

Q.73 **Assertion :** Telocentric chromosome has two unequal arms.
Reason : The centromere is situated close to its end forming one extremely short arm.

Q.74 **Assertion :** Chloroplast is semi-autonomous organelle.
Reason : The ribosomes of the chloroplast are smaller than cytoplasmic ribosomes.

Q.75 **Assertion :** Lipids are arranged within the cell membrane with the hydrophobic tails towards the inner part.
Reason : This ensures that non-polar tail of saturated hydrocarbons is protected from the aqueous environment.

ANSWER KEY

Q.1	3	Q.2	1	Q.3	3	Q.4	2	Q.5	4	Q.6	2	Q.7	2
Q.8	4	Q.9	1	Q.10	4	Q.11	4	Q.12	3	Q.13	3	Q.14	3
Q.15	1	Q.16	3	Q.17	4	Q.18	1	Q.19	1	Q.20	4	Q.21	3
Q.22	1	Q.23	4	Q.24	1	Q.25	3	Q.26	2	Q.27	2	Q.28	2
Q.29	2	Q.30	1	Q.31	3	Q.32	1	Q.33	4	Q.34	3	Q.35	3
Q.36	1	Q.37	3	Q.38	3	Q.39	4	Q.40	4	Q.41	4	Q.42	1
Q.43	2	Q.44	1	Q.45	1	Q.46	4	Q.47	3	Q.48	1	Q.49	4
Q.50	2	Q.51	1	Q.52	1	Q.53	2	Q.54	3	Q.55	1	Q.56	4
Q.57	1	Q.58	2	Q.59	1	Q.60	1	Q.61	4	Q.62	4	Q.63	3
Q.64	1	Q.65	2	Q.66	1	Q.67	2	Q.68	1	Q.69	1	Q.70	3
Q.71	3	Q.72	3	Q.73	4	Q.74	2	Q.75	1				