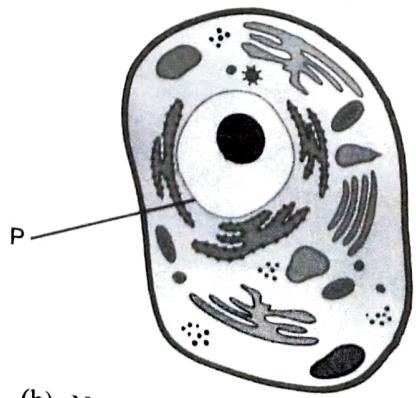
5 The Fundamental Unit of Life

Question Bank

A. MULTIPLE CHOICE QUESTIONS

Select and write the most appropriate option out of the four options.

1. Rough ER contains
   (a) Golgi apparatus (b) carbohydrate synthesising machinery
   (c) ribosomes (d) lysosomes
2. Photosynthesis occurs in which type of plastid ?
   (a) Leucoplast (b) Chloroplast (c) Chromoplast (d) None of these
3. Which cell organelle is known as storage bag and suicidal bag?
   (a) Mitochondria (b) Vacuole (c) Ribosome (d) Lysosome
4. Genetic material of a eukaryotic cell is contained in
   (a) nucleolus (b) nucleus (c) nucleoplasm (d) nucleoid
5. Cell wall in a plant cell is
   (a) permeable (b) selective permeable (c) semipermeable (d) impermeable
6. A cell placed in salt solution swells up. The solution is
   (a) hypertonic (b) isotonic
   (c) hypotonic (d) both hypertonic and isotonic
7. A cell when placed in water solution, no change occurs. The solution is
   (a) hypertonic (b) isotonic
   (c) hypotonic (d) both hypertonic and isotonic
8. Cell organelle without membrane is
   (a) ribosome (b) nucleus (c) Golgi apparatus (d) chloroplast
9. Cell wall of which organism is not made up of cellulose?
   (a) neem tree (b) cactus (c) mushroom (d) *Hydrilla*
10. This cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell—
    (a) Plastids (b) Golgi apparatus (c) SER (d) Lysosomes
11. Both fish and frog are eukaryotic organisms. The functions involving storage, modification and packaging of products in vesicles in the cells of these organisms are performed by
    (a) ER (b) SER (c) Ribosomes (d) Golgi body
12. Refer to the picture of animal cell below and identify the organelle labelled as P.



(a) Chlorophyll (b) Nucleus (c) Vacuole (d) Ribosome

13. What property of the plasma membrane helps amoeba acquire food? [CBSE Competency Based Question]

(a) It is selectively permeable.
(b) It is made up of proteins and lipids.
(c) It is flexible.
(d) It allows diffusion of some substances across it.

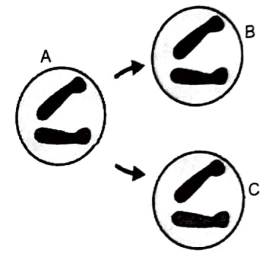
14. Match the following columns.

	Column I		Column II
1.	Mitochondria	A	Suicidal bag of cell
2.	Ribosomes	B	Packaging of materials
3.	Lysosomes	C	Power house of cell
4.	Golgi apparatus	D	Protein factory of cell

Select the correct option.

(a) 1-D, 2-B, 3-A, 4-C
(b) 1-B, 2-D, 3-A, 4-C
(c) 1-C, 2-D, 3-A, 4-B
(d) 1-D, 2-C, 3-A, 4-B

15. Refer to the diagram showing a stage of division in a cell.



How many chromosomes do cells B and C have if cell A has 8 chromosomes?

(a) 8 and 8, respectively
(b) 4 and 2, respectively
(c) 4 and 4, respectively
(d) 6 and 2, respectively

16. Select true statements about prokaryotic and eukaryotic cells.

A. Prokaryotic cells have a well-defined nucleus and membrane-bound organelles.
B. Eukaryotic cells have a well-defined nucleus with a nuclear membrane.
C. Prokaryotic cells lack membrane-bound organelles such as mitochondria and Golgi apparatus.
D. Eukaryotic cells contain a nucleoid instead of a nucleus.

The true statements are:

(a) A and C
(b) B and D
(c) B and C
(d) C and D

17. Which of the following best describes the function of the plasma membrane?

(a) It allows all substances to pass freely in and out of the cell.
(b) It prevents the entry of all materials into the cell.
(c) It allows selective entry and exit of substances, thereby maintaining homeostasis.
(d) It provides structural support to the cell but does not participate in regulating substances.

18. Which of the following statements accurately describe osmosis in relation to cells in different solutions?

(a) In a hypertonic solution, the cell will lose water and shrink.
(b) In an isotonic solution, water will move equally in and out of the cell, and the cell will remain unchanged.
(c) In a hypotonic solution, water will move out of the cell, causing it to become flaccid.
(d) Osmosis requires energy to move water through the cell membrane.

19. Which of the following are correct regarding the processes of endocytosis and exocytosis?

(a) Both endocytosis and exocytosis are forms of active transport.
(b) Endocytosis involves the cell taking in materials by engulfing them with the plasma membrane, while exocytosis involves expelling materials from the cell.
(c) Endocytosis does not require energy, while exocytosis does.
(d) Phagocytosis is a type of endocytosis, where the cell engulfs solid particles for ingestion.

20. Which statement best describes an isotonic solution in terms of osmosis?

(a) There is no movement of water across the membrane.
(b) Water moves into the cell, causing it to swell.
(c) The water concentration inside the cell is lower than outside.
(d) Water moves out of the cell, causing it to shrink.

B. ASSERTION – REASON BASED QUESTIONS

Following question consist of two statements — Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option (a), (b), (c) and (d) as given below:

(a) Both, Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

(b) Both, Assertion (A) and Reason (R) are true, and Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

1. **Assertion (A)** : Every multicellular organism has come from a single cell.
   Reason (R) : Cells divide to produce cells of their own kind. All cells thus come from pre-existing cells.
2. **Assertion (A)** : Mitochondria are known as the powerhouse of the cell.
   Reason (R) : Mitochondria are a cell organelle found in all the eukaryotes.
3. **Assertion (A)** : Lysosomes are considered as 'suicidal bags' of the cell.
   Reason (R) : When the cell is damaged, the enzymes present inside the lysosomes digest their own cells.
4. **Assertion (A)** : Diffusion plays an important role in gaseous exchange between the cells and its external environment.
   Reason (R) : The movement of water molecules through a selectively permeable membrane is called osmosis.
5. **Assertion (A)** : The cell wall is living and freely permeable to all substances.
   Reason (R) : Cell wall is rigid outer covering of plant cell.
6. **Assertion (A)** : The cell lose water by osmosis in a hypertonic solution.
   Reason (R) : In hypertonic solution, external medium contains a lower concentration of water than the cell.
7. **Assertion (A)** : Eukaryotic cells have nuclear membrane and membrane-enclosed organelles.
   Reason (R) : Eukaryotic cells divide by meiosis only.
8. **Assertion (A)** : SER plays an important role in detoxification.
   Reason (R) : Digestive enzymes of lysosomes are made by RER.

C. SOURCE-BASED/CASE-BASED QUESTIONS

1. Each chloroplast is bounded by two membranes, outer and inner membrane. Inside inner membrane, there are two distinct regions. Grana (Singular-Granum) are the stacks of membrane bound sacs. The chlorophyll found in these structures is the sight for the process of light reaction of photosynthesis. The space outside the grana is a liquid.
   (i) How does the structure of chloroplast contribute to its role in photosynthesis?
   (ii) Compare the functions of the outer and inner membranes of the chloroplast.
   (iii) What is the significance of the grana in the process of photosynthesis?
   (iv) What could be the purpose of the liquid space surrounding the grana in chloroplasts?
2. It is a rod shaped double membrane structure. The outer membrane is very porous but smooth and the inner membrane is folded into large finger like structures. The space between the inner membrane is filled with matrix. The folds of the inner membrane create a large surface area for energy-generating chemical reactions.
   (i) Identify the organelle and its location in a eukaryotic cell.
   (ii) What is the significance of the inner membrane's folds in enhancing the function of this organelle?
   (iii) How does the matrix between the inner and outer membranes contribute to the organelle's function?
   (iv) How does the porosity of the outer membrane impact the overall function of this organelle?