



Indian School Al Wadi Al Kabir

Mid-term Examination (2025-2026)

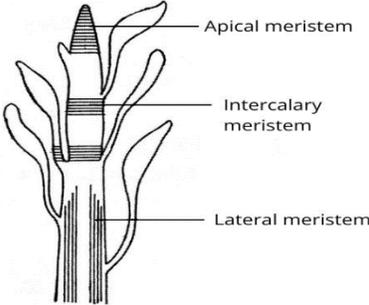
Marking scheme

Class: IX
Date: 18/09/2025

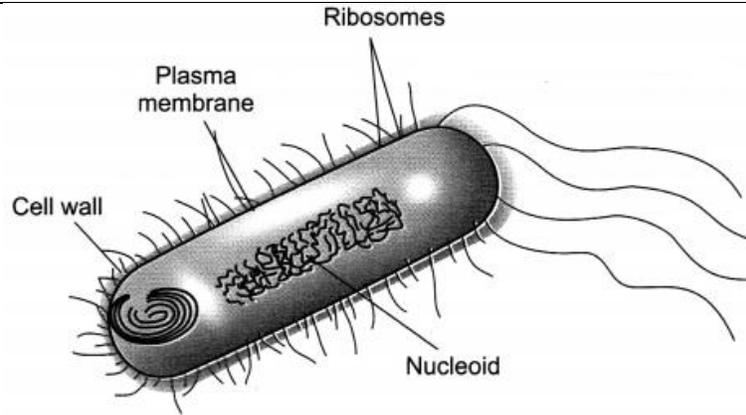
Subject: SCIENCE (086)
Set- I

Max. marks: 80
Time: 3hours

Section – A		MARKS												
1	A. To suit the specific functions they perform.	1												
2	A. Packaging and modification of molecules	1												
3	D. Mitosis takes place in the body cells.	1												
4	A. The cell labelled 1, where the protoplasm has shrunken and pulled away from the cell wall.	1												
5	C. Sclerenchyma	1												
6	B. Lateral meristem	1												
7	B. Cells undergo differentiation, take up a specific role, lose the ability to divide, and form permanent tissues.	1												
8	A. Both A and R are true, and R is the correct explanation of A.	1												
9	A. Both A and R are true, and R is the correct explanation of A.	1												
10	(i) Mitochondria are called the powerhouse of the cell because they release energy for the cell's activities. (1) (ii) Lysosomes are called suicide bags because they contain digestive enzymes which can digest the cell itself if the lysosome bursts. (1)	2												
11	<p><u>Students to attempt either option A or B.</u></p> <p>A. (i)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Feature</th> <th style="text-align: center;">Prokaryotic Cell</th> <th style="text-align: center;">Eukaryotic Cell</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Nucleus</td> <td>No true nucleus; DNA is in the nucleoid</td> <td>True nucleus present, bounded by nuclear membrane</td> </tr> <tr> <td style="text-align: center;">Membrane-bound organelles</td> <td style="text-align: center;">Absent</td> <td>Present (mitochondria, ER, etc.)</td> </tr> <tr> <td style="text-align: center;">Size</td> <td style="text-align: center;">Usually smaller</td> <td style="text-align: center;">Usually larger</td> </tr> </tbody> </table>	Feature	Prokaryotic Cell	Eukaryotic Cell	Nucleus	No true nucleus; DNA is in the nucleoid	True nucleus present, bounded by nuclear membrane	Membrane-bound organelles	Absent	Present (mitochondria, ER, etc.)	Size	Usually smaller	Usually larger	2
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	<table border="1" data-bbox="375 197 1235 279"> <tr> <td data-bbox="375 197 691 279">Example</td> <td data-bbox="691 197 964 279">Bacteria</td> <td data-bbox="964 197 1235 279">Plant and animal cells</td> </tr> </table> <p data-bbox="375 285 1235 426">Any 1 difference ($\frac{1}{2} + \frac{1}{2} = 1$) (ii) The inner membrane of mitochondria is deeply folded to form cristae, which increase the surface area for energy-producing chemical reactions/ ATP production. (1)</p> <p data-bbox="857 432 911 464" style="text-align: center;">OR</p> <p data-bbox="375 470 402 501">B.</p> <table border="1" data-bbox="451 501 1154 867"> <thead> <tr> <th data-bbox="451 501 613 657">Feature</th> <th data-bbox="613 501 927 657">Rough Endoplasmic Reticulum (RER)</th> <th data-bbox="927 501 1154 657">Smooth Endoplasmic Reticulum (SER)</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 657 613 741">Structure</td> <td data-bbox="613 657 927 741">The surface has ribosomes attached</td> <td data-bbox="927 657 1154 741">Surface lacks ribosomes</td> </tr> <tr> <td data-bbox="451 741 613 867">Function</td> <td data-bbox="613 741 927 867">Helps in the manufacture of proteins</td> <td data-bbox="927 741 1154 867">Helps in the manufacture of lipids</td> </tr> </tbody> </table> <p data-bbox="375 909 1235 1014">Role in membrane biogenesis: The proteins and lipids synthesised by RER and SER help in the building of the cell membrane. ($\frac{1}{2} \times 4 = 2$)</p>	Example	Bacteria	Plant and animal cells	Feature	Rough Endoplasmic Reticulum (RER)	Smooth Endoplasmic Reticulum (SER)	Structure	The surface has ribosomes attached	Surface lacks ribosomes	Function	Helps in the manufacture of proteins	Helps in the manufacture of lipids	
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12	 <p data-bbox="370 1419 862 1455">($\frac{1}{2} \times 4 = 2$, $\frac{1}{2}$- Drawing $1\frac{1}{2}$- Labelling)</p>	2												
13	<p data-bbox="370 1461 1179 1528">Chloroplasts: They contain the green pigment chlorophyll and carry out photosynthesis, helping in the manufacture of food.</p> <p data-bbox="370 1570 1219 1671">Chromoplasts: These plastids contain pigments other than chlorophyll, such as orange, red or yellow. They provide colour to flowers and fruits.</p> <p data-bbox="370 1713 1211 1787">Leucoplasts: These are colourless plastids. They are mainly used for the storage of starch, oils and proteins. ($1 \times 3 = 3$)</p>	3												
14	<p data-bbox="370 1793 402 1824">(i)</p> <p data-bbox="370 1866 1166 1896">The special tissue with air-filled spaces is called Aerenchyma.</p>	3												

	<p>It helps the plant float in water and provides buoyancy. ($\frac{1}{2} + \frac{1}{2} = 1$)</p> <p>(ii) (a) The tissue B is Sclerenchyma ($\frac{1}{2}$)</p> <p>(b) Distinction based on cell wall:</p> <p>Collenchyma (A): Cell walls are irregularly thickened at corners, composed mainly of cellulose and pectin.</p> <p>Sclerenchyma (B): Cell walls are uniformly thickened with lignin, making them hard and rigid. ($\frac{1}{2} + \frac{1}{2} = 1$)</p> <p>(c) Importance of tissue A (Collenchyma):</p> <p>Provides mechanical support and elasticity to the plant.</p> <p>It helps in bending of young stems and leaves without breaking. ($\frac{1}{2}$)</p>	
15	<p>A.</p> <ul style="list-style-type: none"> • The onion bulb in Jar 1 has longer roots. • Reason: The root tips were intact, and growth occurs at the tips because of meristematic tissue present there. (2) <p>OR</p> <p>B. Characteristics of meristematic tissue (any two):</p> <ol style="list-style-type: none"> 1. Cells are small, thin-walled, and actively dividing. 2. They have a dense cytoplasm and a prominent nucleus, but no vacuoles (2) <p>C. The meristematic tissue responsible for the increase in length of onion roots is the Apical meristem. (1)</p> <p>D. The roots in Jar 2 stopped growing after Day 4 because the apical meristem at the tip was removed by cutting, and hence no further cell division and elongation could occur. (1)</p>	4
16	<p><u>Attempt either option A or B.</u></p> <p>A.</p>	5



(i) **A typical prokaryotic cell**

(Drawing 1- Labelling any two parts - ($\frac{1}{2} + \frac{1}{2} = 1$))

(ii) **Structure of the Nucleus**

1. The nucleus has a **double-layered nuclear membrane**.
2. The nuclear membrane has **pores** that allow the transfer of material between the nucleus and cytoplasm.
3. The nucleus contains **chromosomes** (visible as rod-shaped structures during cell division).
4. **Chromosomes** are made up of **DNA and protein**.
5. **DNA molecules** carry hereditary information and instructions for cell construction and organisation.
6. Functional segments of DNA are called **genes**.
7. In a non-dividing cell, DNA is present as **chromatin material** (thread-like, entangled structures).
8. During cell division, chromatin material condenses to form **chromosomes**. (2)

Functions of the Nucleus

1. **Controls all cellular activities** by directing chemical processes in the cell.
2. **Carries genetic information** in the form of DNA, which is passed on from parents to the next generation.
3. **Regulates inheritance of characters** through genes.
4. **Plays a central role in cell reproduction**, ensuring the formation of new cells.

5. Determines the way a cell develops and the form it exhibits at maturity (influence of both nucleus and environment).

(Any 1 function- 1)

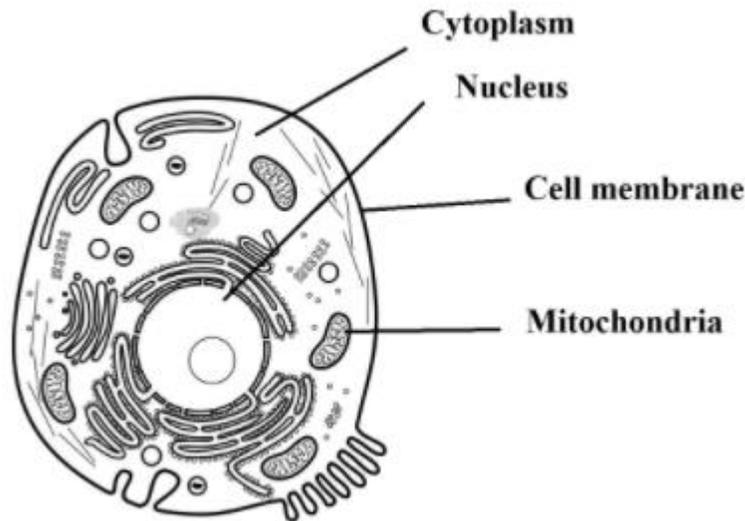
OR

B. (i)

Plant cell	Animal cell
1. The cell wall is the outermost covering on the cell. The plant cells have both cell wall and the cell membrane	1. The cell membrane or plasma membrane is the outermost covering of the cell. The animal cells do not have cell wall
2. The vacuoles are large and centrally placed.	2. The vacuoles are small and uniformly distributed in the cytoplasm.
3. There are plastids in the plant cells. The chloroplasts have chlorophyll.	3. The plastids are absent in the animal cells.
4. The lysosomes are absent in the plant cells.	4. Lysosomes are present in the animal cells. They contain digestive enzymes.
5. The cytoplasm is thin and pushed to the periphery due to central vacuole.	5. The cytoplasm is dense and granular. It is uniformly spread throughout the cell.

Any two points each - ($\frac{1}{2} \times 4 = 2$)

(ii)



(3-Drawing – 1 Labelling - ($\frac{1}{2} \times 4 = 2$))

Section – B

17	C. Evaporation, diffusion, expansion of gases	1
18	A. High pressure, low temperature	1
19	C. increase in surface area, rise in temperature	1
20	A. 298 K, 311 K and 339 K	1
21	C. Water (H ₂ O)	1
22	C. Oil and water	1
23	B. It can be separated into its components by physical methods.	1
24	A. Both A and R are true, and R is the correct explanation of A.	1
25	A. Perfumes diffuse very fast and can reach to people sitting several metres away. B. Oxygen < Water < Sugar	1 1
26	<u>Attempt either option A or B.</u> A. (a) H ₂ O - C (Water) (b) He (Helium)- E (c) Cl ₂ (Chlorine gas) - E(d) CO (Carbon monoxide) - C (e) Co- Cobalt - E (ii) Physical change- No change in the composition of the matter Chemical change – Change in the composition of matter OR B. (i) Air has variable composition while water has fixed composition The components of the air can be separated using physical methods while the components of water cannot be separated using physical methods (ii) Metals, Non-metals and metalloids	$\frac{1}{2} \times 5 = 2\frac{1}{2}$ $\frac{1}{2}$ $1 \times 2 = 2$ 1
27	A. A homogeneous mixture has a uniform composition throughout, such as salt dissolved in water. A heterogeneous mixture has a non-uniform composition with distinct phases, such as sand in water B. Cu metal conducts electricity	$\frac{1}{2} \times 4 = 2$ 1

	Section – C	
30	C. acceleration	1
31	B. its acceleration	1
32	A. Both A and R are true, and R is the correct explanation of A.	1
33	$a = v-u/t = (12-8)/2 = 2 \text{ m/s}^2$ $f = 0.150 \text{ kg} \times 2 \text{ m/s}^2 = 0.30 \text{ N}$	2
34	<p><u>Attempt either option A or B.</u></p> <p>A.</p> <p>(i) (a) rest (b) uniform speed and rest.</p> <p>(ii) $s = ut + \frac{1}{2} at^2 = 5 \times 4 + \frac{1}{2} \times (-2.5) 4^2 = 20 - 20 = 0$, particle reached to the same point.</p> <p style="text-align: center;">OR</p> <p>B.</p> <p>(i) No (ii) two suitable examples.</p>	2
35	<p>(i)(a) $u = 0$, $v = 72 \text{ km/h} = 20 \text{ m/s}$, $t = 5 \text{ sec}$. $a = v-u/t = 20-0/5 = 4 \text{ m/s}^2$.</p> <p>(b) $s = ut + \frac{1}{2} at^2 = \frac{1}{2} \times 4 \times 5 \times 5 = 50 \text{ m}$.</p> <p>(ii) two differences</p>	3
36	<p>(i) Momentum is the product of mass and velocity. Kg m/s (ii)</p> <p style="text-align: center;">We have $F = kma$. Thus,</p> <p style="text-align: center;">$F_1 = k (2.0 \text{ kg}) (2.5 \text{ m/s}^2)$, and $F_2 = k (5.0 \text{ kg}) (2.0 \text{ m/s}^2)$.</p> <p style="text-align: center;">These equations give</p> <p style="text-align: center;">$\frac{F_2}{F_1} = \frac{5.0 \times 2.0}{2.0 \times 2.5} = 2$.</p>	3
37	<p>(i) Statement third law. (ii) One example. When a fireman holds a hose, which is ejecting large amounts of water at a high velocity, then a reaction force is exerted on him by the ejecting water in the backwards direction. This is because of Newton's third law of motion. As a result of the backwards force, the stability of the fireman decreases. Hence, it is difficult for him to remain stable while holding the hose.</p>	3

38	<p>A. distance = area on time axis = $6 \times (10-4) = 36 \text{ m}$ B. acceleration and retardation <u>Attempt either subpart C or D.</u> C. distance, in 0 to 4 sec = area of right-angle triangle = $\frac{1}{2} \times 4 \times 6 = 12 \text{ m}$. distance, in 10 to 16 sec = area of right-angle = $\frac{1}{2} \times 6 \times 6 = 18 \text{ m}$. OR D. average speed = total distance/total time = $36 + 12 + 18 / 16 = 66/16 = 4.125 \text{ m/s}$</p>	4
39	<p><u>Attempt either option A or B.</u> A. (i) statement (ii) proof, $f = ma$ OR $F = \frac{p_2 - p_1}{t - 0}$ or The momentum at $t = 1 \text{ s}$ is At $t = 2 \text{ s}$, it is At $t = 5 \text{ s}$, it is B.</p> <p>$p_2 = p_1 + Ft = Ft.$ $p_2 = Ft = (12 \text{ N}) \times (1 \text{ s}) = 12 \text{ N s}.$ $p_2 = (12 \text{ N}) \times (2 \text{ s}) = 24 \text{ N s}.$ $p_2 = (12 \text{ N}) \times (5 \text{ s}) = 60 \text{ N s}.$</p>	5