



Indian School Al Wadi Al Kabir

Mid-term Examination (2026-2027)

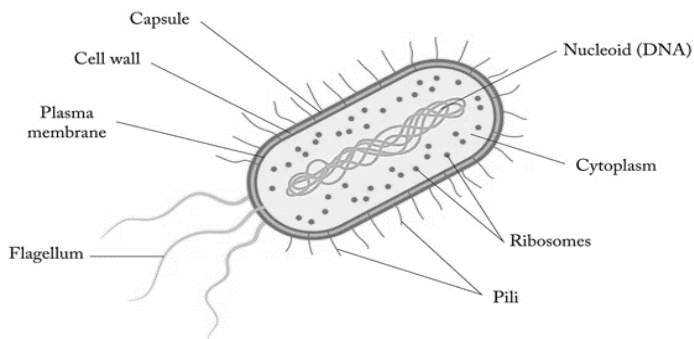
Marking scheme

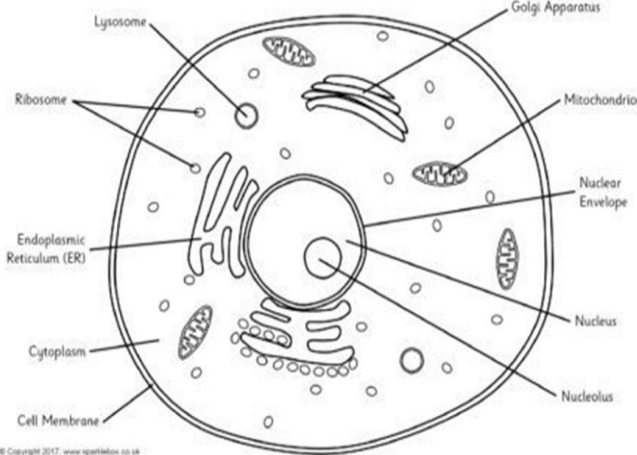
Class: IX
Date: 17/09/2026

Subject: SCIENCE
Set- II

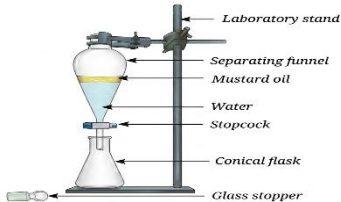
Max. marks: 80
Time: 3hours

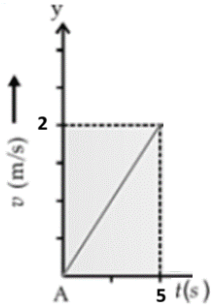
Section – A		MARKS
1	B. Process A maintains the chromosome number during growth, while Process B produces gametes.	1
2	B. Beaker Q	1
3	A. It has a lipid bilayer with proteins embedded in it.	1
4	B. Gaseous exchange and evaporation of water vapours	1
5	C. The favourable and unfavourable growth conditions during different years	1
6	B. Companion cells — monitor loading and unloading of sugars in sieve tubes	1
7	C. Collenchyma	1
8	D. A is false, but R is true.	1
9	A. Both A and R are true, and R is the correct explanation of A.	1
10	(i) Lysosomes are called the clean-up system because they are single membrane-bound sacs filled with enzymes, which can break down unwanted proteins, carbohydrates, fats, and damaged parts of the cell, keeping it clean and healthy. (ii) (a) Y is the Golgi apparatus. (b) Function: It modifies, sorts, and packages proteins and/or lipids into vesicles for transport, secretion, or lysosome formation. (Any 1 function)	1+ ½+ ½=2
11	Option A: (i) A thick cuticle reduces water loss in the process of transpiration by stomata, which is advantageous to a plant in dry (desert) conditions. (ii) Root hairs increase the surface area for absorption of water and minerals from the soil. So, greater number of root hairs provides greater surface area for absorbing water and minerals. OR	1+1=2

	Option B: The cells of meristematic tissue are small, have thin cell walls, a large and prominent nucleus, and dense cytoplasm with many organelles. Vacuoles are generally absent, and the cells are tightly packed with little or no intercellular space. These characteristics allow them continuous and rapid cell division.																			
12	(i) Sclerenchyma cells (found in coconut husk) have thick walls due to deposition of lignin, making them hard and strong; most of these cells are dead. (ii) (a) These cells become permanent tissues. (b) This process is called differentiation.	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$																		
13	BACTERIAL CELL  (i) (Diagram 1- Label 1) (ii) Any 1 point each <table border="1"> <thead> <tr> <th>Characteristics</th><th>Prokaryotic cell</th><th>Eukaryotic cell</th></tr> </thead> <tbody> <tr> <td>Primitive nucleus</td><td>Present</td><td>Absent</td></tr> <tr> <td>Diameter of a typical cell</td><td>1 to 10 μm</td><td>10 to 100 μm</td></tr> <tr> <td>Number of cells in an organism</td><td>Usually, unicellular</td><td>Can be unicellular or multicellular</td></tr> <tr> <td>Membrane-bound organelles</td><td>Absent</td><td>Present</td></tr> <tr> <td>Membrane-bound nucleus</td><td>Absent</td><td>Present</td></tr> </tbody> </table>	Characteristics	Prokaryotic cell	Eukaryotic cell	Primitive nucleus	Present	Absent	Diameter of a typical cell	1 to 10 μm	10 to 100 μm	Number of cells in an organism	Usually, unicellular	Can be unicellular or multicellular	Membrane-bound organelles	Absent	Present	Membrane-bound nucleus	Absent	Present	$2 + \frac{1}{2} + \frac{1}{2} = 3$
Characteristics	Prokaryotic cell	Eukaryotic cell																		
Primitive nucleus	Present	Absent																		
Diameter of a typical cell	1 to 10 μm	10 to 100 μm																		
Number of cells in an organism	Usually, unicellular	Can be unicellular or multicellular																		
Membrane-bound organelles	Absent	Present																		
Membrane-bound nucleus	Absent	Present																		
14	<table border="1"> <thead> <tr> <th>Meristem</th><th>Location</th><th>Function</th></tr> </thead> <tbody> <tr> <td>Apical meristem</td><td>At the tips of roots and shoots</td><td>Helps the plant grow in length</td></tr> <tr> <td>Lateral meristem</td><td>Arranged in a ring in the stem (Sides or circumference of the stem)</td><td>Increases girth (diameter) of the stem</td></tr> </tbody> </table>	Meristem	Location	Function	Apical meristem	At the tips of roots and shoots	Helps the plant grow in length	Lateral meristem	Arranged in a ring in the stem (Sides or circumference of the stem)	Increases girth (diameter) of the stem	$1 + 1 + 1 = 3$									
Meristem	Location	Function																		
Apical meristem	At the tips of roots and shoots	Helps the plant grow in length																		
Lateral meristem	Arranged in a ring in the stem (Sides or circumference of the stem)	Increases girth (diameter) of the stem																		

	Intercalary meristem Located at the base of internode or just above the node Helps plants regenerate/regrow after cutting or grazing	
15	Option A: The three plastids are: leaves — chloroplast; coloured flowers/fruits — chromoplast; storage regions (tubers) — leucoplast. Function of the plastid in leaves (chloroplast): It contains chlorophyll, which absorbs sunlight, enabling the plant to prepare food by the process of photosynthesis. OR Option B: Similarity: Both mitochondria and plastids have their own DNA and ribosomes, and thus can make some of their own proteins. Difference: Mitochondria release energy through cellular respiration (breakdown of glucose to form ATP), while plastids (chloroplasts) synthesise food through photosynthesis. C. The colourless plastid is called the leucoplast. It stores food material, such as starch, oils or proteins. D. Bright colours (yellow, orange or red) in flowers and fruits help in attracting pollinators for pollination and fruit-eating animals that help in seed dispersal.	2+1+1=4
16	Animal Cell  © Copyright 2017, www.spotblaze.co.uk i. Diagram (1) Label- 2	3+2=5

	(ii) <table> <tr> <th>Feature</th><th>RER</th><th>SER</th></tr> <tr> <td>Structure</td><td>Has ribosomes attached to its surface, looks rough under electron microscope</td><td>Does not have ribosomes on its surface, looks smooth</td></tr> <tr> <td>Function</td><td>Mainly involved in protein synthesis and protein secretion (e.g., gland cells, such as pancreatic cells)</td><td>Involved in the synthesis and storage of fats and hormones</td></tr> </table> OR Option B: (i) The outer membrane of mitochondria is smooth and porous, while the inner membrane is folded into finger-like projections called cristae. The cristae increase the surface area for chemical reactions and facilitate energy production. (ii) Diameter of field of view = 6 mm = 6000 μm Number of cells along diameter = 30 Estimated size of one onion cell = 6000 μm / 30 = 200 μm (iii) Contact inhibition: In many animal cells, cell division usually stops when cells come in contact with neighbouring cells; this process is called contact inhibition. Cancer cells lose this control and keep dividing uncontrollably, leading to the formation of tumours.	Feature	RER	SER	Structure	Has ribosomes attached to its surface, looks rough under electron microscope	Does not have ribosomes on its surface, looks smooth	Function	Mainly involved in protein synthesis and protein secretion (e.g., gland cells, such as pancreatic cells)	Involved in the synthesis and storage of fats and hormones	2+1+2=5
Feature	RER	SER									
Structure	Has ribosomes attached to its surface, looks rough under electron microscope	Does not have ribosomes on its surface, looks smooth									
Function	Mainly involved in protein synthesis and protein secretion (e.g., gland cells, such as pancreatic cells)	Involved in the synthesis and storage of fats and hormones									
	Section – B										
17	D. The positive charge and mass of the atom are concentrated in a very small volume at the centre.	1									
18	A. The solubility of solids increases, while the solubility of gases decreases.	1									
19	B. Camphor	1									
20	C. Butter	1									
21	C. By using differences in their interactions with the solvent and the paper as they move up at different speeds.	1									
22	B. Sublimation	1									
23	C. Smoke consisting of solid particles suspended in air	1									
24	C. A is true, but R is false.	1									
25	$\text{Concentration (w/v\%)} = \left(\frac{15 \text{ g}}{300 \text{ mL}} \right) \times 100$ $\text{Concentration (w/v\%)} = \frac{15}{3} = 5\%$	2									

26	<u>Attempt either option A or B.</u> A.(i) True solution- less than 1nm Colloids- 1-1000 nm Suspension- more than 1000 nm (ii) Tyndall effect is defined as the scattering of light by particles. (iii) any 2 OR B. (i) A crystal is a solid that is made up of particles arranged in a regular geometric pattern (ii) Differences in the solubility of a substance at different temperatures. (iii) The slower the rate of evaporation, the larger the crystals will be.	3
27	(i) Radioactivity (ii) J J Thomson (iii) Electrons revolve around the nucleus.	3
28	A. Simple distillation. Difference in boiling point is more than 25⁰C. B. Acetone will be collected because of its lower boiling point. C. Fractional distillation. Difference in boiling point is less than 25⁰C. OR C. A condenser is used to cool down the vapours and convert them into liquid. We receive both liquids after distillation. Simple evaporation is suitable only for separating a non-volatile solid dissolved in a volatile liquid	4
29	<u>Attempt either option A or B.</u> A. (a) Colloid. Any property of colloid. Centrifugation (b) The separation of particles based on their size, shape and density using centrifugal force. (c) Any one difference. (d) Mud from muddy water-Alum is the coagulant OR Cheese from milk- Acid is the coagulant B. (a) Separating funnel.  (b) Paper chromatography. Procedure. (c) By using a beam of light. Path is not visible in solution whereas it is visible in colloids.	5

	Section – C	
30	C. $s = u t$	1
31	B. (fig.b)	1
32	C. A is true, but R is false.	1
33	(i) Displacement = 3 m [1] (ii) $Velocity = \frac{displacement}{time}$ [1/2] $V = \frac{3}{30}$ or 0.1 m/s [1/2]	2
34	A.(i) Definition of acceleration or formula [1] Unit is $\frac{m}{s^2}$ [1/2] (ii) Vector [1/2] OR B.(i) speed is scalar and velocity is vector [$\frac{1}{2} + \frac{1}{2}$] Unit is m/s [1/2] (ii) Speed is scalar [1/2]	2
35	(i) definition of uniform circular motion [1] (ii) direction keeps on changing [1] Hence velocity is different at different points [1]	3
36	(i) body -P, less slope [1/2+1/2] (ii) displacement /distance [1] (iii) uniform velocity/uniform motion /zero acceleration [1]	3
37	(i)  graph [1] (ii) $U = 0$, $a = 0.5 \text{ m/s}^2$, $t = 50 \text{ s}$ $V = u + at$ [1/2] $V = 0 + 0.5 \times 50$ $V = 25 \text{ m/s}$ [1/2] $S = ut + \frac{1}{2} at^2$ [1/2] $S = 0 + \frac{1}{2} \times 0.5 \times 50^2 = 625 \text{ m}$ [1/2]	3
38	A. slope = acceleration [1] B. BC [1]	4

	C. a = slope of CD [1/2] $a = \frac{\text{change in } Y \text{ axis}}{\text{change in } X\text{-axis}}$ or $\frac{0-4}{14-10} = \frac{-4}{4}$ [1/2+1/2] $a = -1 \frac{m}{s^2}$ [1/2] [Without -ve answer, reduce ½ marks] <u>OR</u> D. Distance = area under the graph AB [1/2] $S = \frac{1}{2} \times \text{base} \times \text{height}$ OR $= \frac{1}{2} \times 4 \times 4$ [1] $S = 8m$ [1/2]	
39	A. (i) Derive , $V = U + at$ Fig. or Explanation [1/2] Labelled graph [1/2] Slope [1/2] Simplifying and Final answer [1/2] (ii) Derive , $S = Ut + \frac{1}{2} at^2$ $S = \text{Area under the graph}$ [1] Simplifying [1/2] (iii) $U = 0$, $a = 2 \text{ ms}^{-2}$, $t = 30 \text{ s}$, $V = ?$ $V = u + at$ [1/2] $V = 0 + 2 \times 30$ [1/2] $V = 60 \text{ m/s}$ [1/2] <u>OR</u> B.(i) Derive , $V^2 = U^2 + 2aS$ Fig. or Explanation [1/2] Labelled graph [1/2] displacement [s] = area under the graph [1/2] Simplifying and Final answer [1/2 + 1/2 + 1/2 + 1/2] (ii) $V = u + at$ [1/2] $25 = 50 + a \times 5$ [1/2] $-25 = 5a$ $a = -5 \frac{m}{s^2}$ [1/2]	5