



B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL



MID TERM EXAM 2026-27

SCIENCE

SET-II

MARKING SCHEME

Class: IX

Date: 11.09.26

Time: 3 hours

Max Marks: 80

Section-A BIOLOGY		
1	D. Hypotonic	1
2	(b) lateral meristem	1
3	(a) cuticle	1
4	(a) Enzymes packed in Lysosomes are made through RER (rough endoplasmic reticulum)	1
5	(b) endocytosis	1
6	(c) Apical and intercalary meristems are permanent tissues	1
7	(b) Columnar epithelium	1
8	B. Both A and R are true, and R is not the correct explanation of A.	1
9	A. Both A and R are true, and R is the correct explanation of A.	1
10	Membrane biogenesis is the process of formation of new cell membranes using proteins and lipids made by the ER.	2
11	A neuron is the structural and functional unit of the nervous system. Function: It receives and transmits nerve impulses.	2
12	Cork is a protective tissue made of dead cells. It is formed by the cork cambium , which produces cork cells.	2
13	A. Large vacuoles store water, food, and wastes and help maintain turgidity. B. If the plasma membrane ruptures, the cell contents leak out and the cell dies. C. i) Mitochondria – Powerhouse of the cell. ii) Lysosomes – Suicidal bags of the cell.	3
14	(a) Differentiation: The process by which meristematic cells become specialized in structure and function. (b) Stomata: Tiny pores on leaf surface. Functions: Exchange of gases. Control transpiration (water loss).	3
15	A. i) Collenchyma ii) Living, elongated cells with unevenly thickened corners. iii) Provides support and flexibility. iv) Found in leaf stalk and stem. OR	4

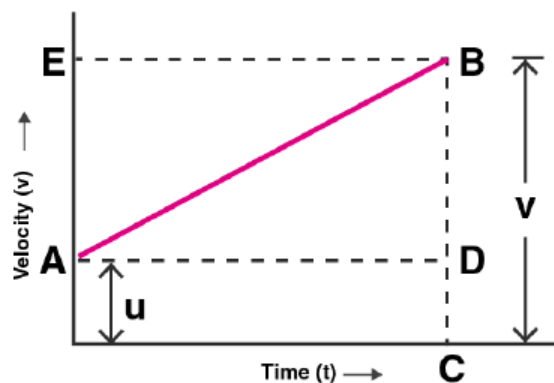
	B.Branches bend freely because collenchyma tissue provides flexibility and mechanical support.	
16	A. (a) Nucleus (b) Golgi apparatus (c) Cell wall (d) Cytoplasm (e) Nucleoplasm OR B.(a) Dry apricots swell in water and shrink in sugar solution. (b) RBC shrinks (crenation). (c) The cell dies if the plasma membrane breaks. (d) No plasmolysis occurs in boiled <i>Rhoeo</i> leaves because the cells are dead. (e) Packaging and secretion of substances stop if the Golgi apparatus is removed.	5
Section-B Chemistry		
17	(b) Malleability	1
18	(c) Saltwater	1
19	(b) Mercury	1
20	(b) Distilled water	1
21	(c) Love	1
22	(b) Sublimation	1
23	(d) Light	1
24	(C) A is true but R is false.	1
25	Temperature in °C = Temperature in K – 273 (a) 357 K = 357 – 273 = 84°C (b) 405 K = 405 – 273 = 132°C	2
26	Evaporation is the process by which a liquid changes into vapour from its surface at a temperature below its boiling point. The rate of evaporation depends on the following factors: 1. Surface Area Greater the surface area, faster is the rate of evaporation.	3

	Example: Clothes spread out dry faster than clothes kept folded. 2. Temperature An increase in temperature increases the rate of evaporation because the particles of the liquid gain more kinetic energy. 3. Wind Speed Higher wind speed increases the rate of evaporation because moving air carries away the water vapour from the surface of the liquid. 4. Humidity Higher humidity decreases the rate of evaporation because the air already contains a large amount of water vapour.	
27	Option A i) Dispersed phase Dispersion medium ii) Colloidal particles are small and cannot be seen with the naked eye. Colloidal particles show the Tyndall effect, i.e., they scatter a beam of light OR Option B i) A homogeneous mixture is a mixture that has a uniform composition throughout. Example: Salt solution or sugar solution. ii) The Tyndall effect is the phenomenon of scattering of light by colloidal particles, due to which the path of a beam of light becomes visible. iii) An unsaturated solution is a solution that contains less than the maximum amount of solute that can be dissolved in a given amount of solvent at a particular temperature.	3
28	i) The clothes dried faster because higher wind speed increases the rate of evaporation by carrying away water vapour from the surface of the clothes. ii) Evaporation of sweat causes cooling of the body and helps maintain normal body temperature. iii) High humidity decreases the rate of evaporation because the air already contains a high amount of water vapour. Therefore, it has less capacity to take up additional water vapour OR	4

	During evaporation, the higher-energy particles escape from the surface of the liquid. The remaining particles have lower average kinetic energy, resulting in a decrease in temperature. Therefore, when alcohol evaporates from the hand, it absorbs heat from the hand and produces a cooling sensation.															
29	Option A i) Differentiate between mixtures and compounds. <table><thead><tr><th>Mixtures</th><th>Compounds</th></tr></thead><tbody><tr><td>A mixture contains two or more substances physically combined.</td><td>A compound is formed when two or more elements chemically combine.</td></tr><tr><td>The components retain their individual properties.</td><td>The compound has properties different from its constituent elements.</td></tr><tr><td>Components can generally be separated by physical methods.</td><td>Components can be separated only by chemical methods.</td></tr><tr><td>The composition can vary.</td><td>The elements are present in a fixed ratio.</td></tr><tr><td>No new substance is necessarily formed.</td><td>A new substance is formed.</td></tr><tr><td>Example: Salt and sand</td><td>Example: Water (H₂O)</td></tr></tbody></table> ii) (a) Cutting of wood – Physical change No new substance is formed. (b) Melting of butter in a pan – Physical change Butter changes its physical state, but no new substance is formed. (c) Rusting of iron nail – Chemical change A new substance, iron oxide (rust), is formed. (d) Dissolving sugar in water – Physical change No new substance is formed, and sugar can be recovered by evaporation. (e) Digestion of food – Chemical change New substances are formed during the digestion process. (f) Burning of paper – Chemical change New substances such as ash and gases are formed.	Mixtures	Compounds	A mixture contains two or more substances physically combined.	A compound is formed when two or more elements chemically combine.	The components retain their individual properties.	The compound has properties different from its constituent elements.	Components can generally be separated by physical methods.	Components can be separated only by chemical methods.	The composition can vary.	The elements are present in a fixed ratio.	No new substance is necessarily formed.	A new substance is formed.	Example: Salt and sand	Example: Water (H ₂ O)	5
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	OR Option B i) Mass of sugar (solute) = 20 g Mass of water (solvent) = 160 g Mass of solution: Mass of solution = Mass of solute + Mass of solvent = 20 + 160 = 180 g Formula: Mass-by-mass percentage = (Mass of solute / Mass of solution) $\times$ 100 = (20 / 180) $\times$ 100 = 11.11% ii) 1. Lustrous: Metals generally have a shiny surface. 2. Hard: Most metals are hard substances. 3. Malleable: Metals can be beaten into thin sheets. 4. Ductile: Metals can be drawn into thin wires. 5. Good conductors: Metals are good conductors of heat and electricity. 6. Sonorous: Metals produce a ringing sound when struck. 7. High melting and boiling points: Most metals have high melting and boiling points.	
Section-C Physics		
30	(c) Gravitational force of the Earth on the Moon	1
31	(d) 4 F	1
32	A. Both A and R are true, and R is the correct explanation of A.	1

33	Uniform velocity means an object covers equal displacements in equal intervals of time while moving in a fixed, straight line. This means both the speed (magnitude) and the direction of the moving body stay completely constant Falling rain drops: After reaching a steady terminal velocity, a raindrop falls straight down at a constant speed in a fixed direction. OR $ \begin{aligned} \text{Average Speed} &= \frac{232375}{21} \text{ km/h} \\ &= \frac{232375}{21} \times \frac{\text{km}}{\text{hr}} \\ &= \frac{232375}{21} \times \frac{\text{km}}{3600 \text{ seconds}} \\ &= \frac{232375}{21 \times 3600} \text{ km/s} \\ &= \frac{232375}{21 \times 3600} \text{ km/s} \\ &= \frac{9295}{21 \times 144} \text{ km/s} \\ &= \frac{9295}{3024} \text{ km/s} \\ &= \mathbf{3.07 \text{ km/s}} \end{aligned} $	2
34	Free fall is the motion of an object where gravity is the only force acting on it, with air resistance completely neglected Gravitational Force (F): The pull of gravity on an object (its weight) is directly proportional to its mass (m), given by $F = mg$. Newton's Second Law ($a = F/m$): Acceleration is the gravitational force divided by the mass ($a = g$).	2
35		3



$$v^2 = u^2 + 2as$$

$s = \text{Area of trapezium OABC}$

$$s = \frac{(OA + BC) \times OC}{2}$$

$$s = \frac{(u + v) \times t}{2}$$

$$s = \left(\frac{u + v}{2} \right) \times \left(\frac{v - u}{a} \right)$$

Or

$$\left(\because \frac{v - u}{t} = a \right)$$

$$s = \frac{v^2 - u^2}{2a}$$

Or

$$v^2 = u^2 + 2as$$

36 Here Mass of the stone, $m = 1\text{kg}$

Initial velocity, $u = 20\text{ms}^{-1}$

Final velocity, $v = 0$

Distance covered, $s = 50\text{m}$

Now, using the equation of motion,

$$v^2 - u^2 = 2as$$

$$\therefore 0^2 - 20^2 = 2a \times 50$$

$$\Rightarrow a = -\frac{400}{100} = -4\text{ms}^{-2}$$

Force of friction, $F = ma = 1 \times (-4) = -4\text{N}$

3

37	10.2.1 TO CALCULATE THE VALUE OF g To calculate the value of g, we should put the values of G, M and R in Eq. (10.9). namely, universal gravitational constant, $G = 6.7 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$, mass of the earth, $M = 6 \times 10^{24} \text{ kg}$, and radius of the earth, $R = 6.4 \times 10^6 \text{ m}$. $g = G \frac{M}{R^2}$ $= \frac{6.7 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2} \times 6 \times 10^{24} \text{ kg}}{(6.4 \times 10^6 \text{ m})^2}$ $= 9.8 \text{ m s}^{-2}.$ Thus, the value of acceleration due to gravity of the earth, $g = 9.8 \text{ m s}^{-2}$.	3
38	(i) The water pushes the swimmer forward. (ii) The swimmer pushes the water backward with their hands. (iii) Newton's third law of motion states that for every action, there is an equal and opposite reaction. OR (iii) NO, because the forces are acting on different bodies.	4

Given that,

Initial velocity $u = 0 \text{ m/s}$

Final velocity $v = 54 \text{ km/h} = 54 \times \frac{5}{18} =$

15 m/s

Time $t = 2 \text{ min} = 120 \text{ s}$

Now, put the value in equation of motion

The acceleration is

$$v = u + at$$

$$a = \frac{v - u}{t}$$

$$a = \frac{15 - 0}{120}$$

$$a = 0.125 \text{ m/s}^2$$

Now, again from equation of motion

The distance is

$$s = ut + \frac{1}{2}at^2$$

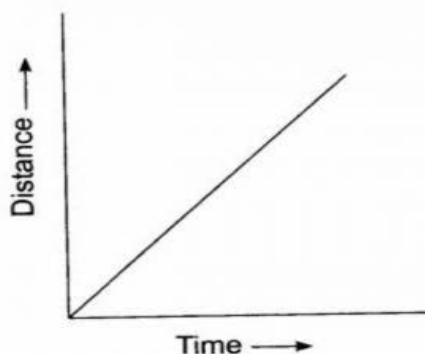
$$s = 0 + \frac{1}{2} \times 0.125 \times 120 \times 120$$

$$s = 900 \text{ m}$$

Hence, the acceleration is 0.125 m/s^2 and distance is 900 m

OR

(a)



Slope of the graph represent the speed

(b)

$$(i) h = \frac{1}{2} \times 10 \times 16 = 80 \text{ m.}$$

$$(ii) v = 0 + 10 \times 4 = 40 \text{ m/s}$$