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-I
MARKING SCHEME

Class: IX **Time: 3 hours**
Date: 11.09.26 **Max Marks: 80**

	Section-A BIOLOGY	
1	(b) shrinkage of cytoplasm in hypertonic medium	1
2	(a) Enzymes packed in Lysosomes are made through RER (rough endoplasmic reticulum)	1
3	(b) endocytosis	1
4	(b) Columnar epithelium	1
5	(c) Apical and intercalary meristems are permanent tissues	1
6	(a) cuticle	1
7	(b) lateral meristem	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	Components: RBC, WBC, Plasma and Platelets. Functions:Transport of oxygen, nutrients, and hormones.Protects the body from infections.	2
11	Cork tissue: Cork is a protective tissue made of dead cells.It is formed by the cork cambium, which produces cork cells.	2
12	Neuron: Structural and functional unit of the nervous system. Function: Receives and transmits nerve impulses	2
13	They are called **complex tissues** because they are made of more than one type of cell. **Xylem** — **Phloem** Transports water and minerals — Transports food Mostly dead cells — Mostly living cells	3
14	**Striated** — **Unstriated** — **Cardiac** Striped, voluntary — No stripes, involuntary — Branched, striped, involuntary Attached to bones — Found in internal organs — Found in heart	3

15	i) Collenchyma ii) Cells are living, elongated, and unevenly thickened at corners. iii) Provides support and flexibility. iv) Found in leaf stalk and stem. OR Branches bend because collenchyma provides flexibility and mechanical support.	4
16	(a) Nucleus (b) Golgi apparatus (c) Cell wall (d) Cytoplasm (e) Nucleoplasm OR (a) Dry apricots swell in water and shrink in sugar solution. (b) RBC shrinks (crenation). (c) Cell dies when plasma membrane breaks. (d) No plasmolysis occurs in boiled Rheo leaves because cells are dead. (e) Packaging and secretion of substances stop if Golgi apparatus is removed.	5
	Section-B Chemistry	
17	(c) Love	1
18	(b) Sublimation	1
19	(d) Light	1
20	(a) Ductility	1
21	(c) Saltwater	1
22	(b) Mercury	1
23	(b) Distilled water	1
24	**(A) Both A and R are true, and R is the correct explanation of A.**	1
25	**(a) 57°C** = 57 + 273 = **330 K** **(b) 165°C** = 165 + 273 = **438 K**	2
26	i) The two components of a solution are: 1. **Solute** – The substance that is dissolved. 2. **Solvent** – The substance in which the solute is dissolved. ii) A solution is a **homogeneous mixture**.	3

	1. The particles of a solution are **very small and cannot be seen with the naked eye**. OR i) **Concentration of a solution** is the amount of solute present in a given amount of solution. ii) The **Tyndall effect** is the scattering of light by colloidal particles, due to which the path of a beam of light becomes visible. iii) A **saturated solution** is a solution that contains the maximum amount of solute that can be dissolved in a given amount of solvent at a particular temperature.	
27	**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 evaporation**. **Example:** Clothes spread out dry faster than clothes kept folded. **2. Temperature** Higher the temperature, **faster is the evaporation** because particles gain more kinetic energy. **3. Humidity** Higher humidity in the atmosphere **slows down evaporation** because the air already contains a large amount of water vapour. **4. Wind speed** Greater wind speed **increases the rate of evaporation** because moving air carries away water vapour from the surface.	3
28	**i) Sublimation** ii) Sublimation generally occurs under **low pressure**. iii) Sublimation is useful for: ● **Purification of substances** such as camphor and naphthalene. ● **Freeze-drying** of food and medicines. ● Separation of sublimable substances from non-sublimable impurities. OR 1. **Naphthalene**	4

	2. **Ammonium chloride**	
29	i) **Differentiate between mixtures and compounds.** **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_2O) ii) **(a) Tearing of paper – Physical change** No new substance is formed. **(b) Melting of ice – Physical change** Ice changes into water, but its chemical composition remains H_2O. **(c) Rusting of almirah – Chemical change** A new substance, iron oxide (rust), is formed. **(d) Dissolving salt in water – Physical change** No new substance is formed and salt can be recovered by evaporation. **(e) Digestion of food – Chemical change** New substances are formed during digestion. **(f) Burning of candle – Chemical change** New substances such as carbon dioxide and water vapour are formed during combustion.	5
	Section-C Physics	
30	(c) the frictional force exerted by the ground	1
31	(b) is maximum at the poles and minimum at the equator	1
32	A. Both A and R are true, and R is the correct explanation of A.	1
33	Non-uniform acceleration is when velocity changes by unequal amounts in equal time intervals, meaning acceleration varies. An everyday example of uniform acceleration is a ball falling freely under gravity, while non-uniform acceleration is seen when a car moves through busy city traffic. or	2

Initial velocity $u = 80 \text{ km h}^{-1}$

$$= \frac{80 \times 1000}{60 \times 60} = \text{m s}^{-1} = 22.22 \text{ m s}^{-1}$$

Final velocity $v = 60 \text{ km h}^{-1}$

$$= \frac{60 \times 1000}{60 \times 60} = 16.66 \text{ m s}^{-1}$$

Time $t = 5$ s

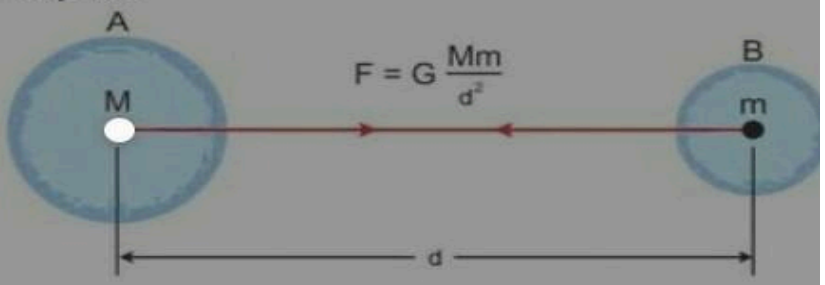
$\therefore \quad a = ?$

$$a = \frac{v - u}{t} = \frac{16.66 - 22.22}{5} = -1.11 \text{ m s}^{-2}$$

$\therefore$ The acceleration of bus is -1.11 m s^{-2}.

34

Every object in this universe attracts every other object with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. The direction of force is along the line joining the centres of two objects.



Consider two bodies A and B of masses M and m respectively and 'd' is the distance between then centres. Let F be the force by which they mutually attract each other

$F \propto M \times m$ (i)

$F \propto 1/d^2$ (ii)

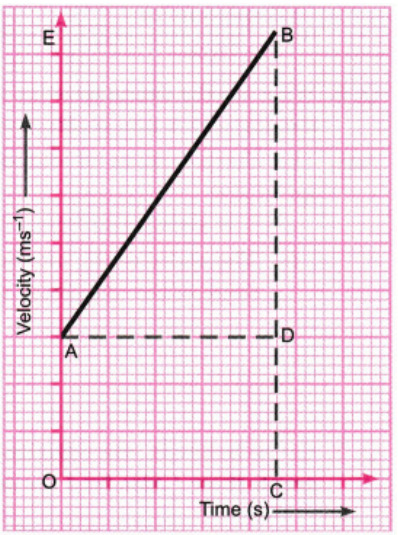
Combine (i) and (ii)

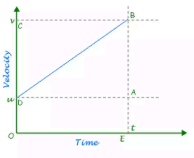
$$F \propto \frac{M \times m}{d^2}$$

$$F = G\frac{M \times m}{d^2}$$

G is universal gravitation constant.

2

35	If we draw AD parallel to OC, we observe that BC = BD + DC = BD + OA Substituting, BC with v and OA with u, we get $v = BD + u$ or $BD = v - u$ ...(1) Thus, from the given velocity-time graph, the acceleration of the object is given by $a = \frac{\text{Change in velocity}}{\text{Time taken}}$ $= \frac{BD}{AD} = \frac{BD}{OC}$ Substituting, OC with t, we get $a = \frac{BD}{t}$ or $BD = at$ ...(2) From equations (1) and (2), we have $\boldsymbol{v - u = at}$ **or** $\boldsymbol{v = u + at}$ 	3
36	**ANSWER** Mass of vehicle = 1500kg Retardation required = $-1.7 ms^{-2}$ Force between road and vehicle = 1500×-1.7=-2550 N This is a friction force.	3
37	**ANSWER** Given that, Mass of the Earth $m_1 = 6 \times 10^{24}$ Kg Mass of the Moon $m_2 = 7.4 \times 10^{22}$ kg Distance between the Earth and the Moon $d = 3.84 \times 10^5$ km $= 3.84 \times 10^8$ m Gravitational Constant $G = 6.7 \times 10^{-11}$ Nm^2/kg^2 Now, by using Newton's law of gravitation $F = \frac{Gm_1m_2}{r^2}$ $F = \frac{6.7 \times 10^{-11} \times 6 \times 10^{24} \times 7.4 \times 10^{22}}{(3.84 \times 10^8)^2}$ $F = \frac{297.48 \times 10^{35}}{14.8225 \times 10^{16}}$ $F = 20.069 \times 10^{19}$ $F = 20.1 \times 10^{19}$ N Hence, the gravitational force of attraction 20.1×10^{19} N	3
38	(i) downward (ii) Newton's Third law of motion (iii) the gas pushes the rocket up with a huge force.	4

	OR (iii) F=ma large mass less acceleration	
39	(i) $u = 0,\ v = 72 km/h$ $= 72 \times \frac{5}{18} = 20\ m/s$ $t = 5\ minutes = 5 \times 60 = 300$ $a = \frac{v-u}{t} = \frac{20-0}{300} = \frac{1}{15}\ m/s^2$ (ii) $2as = v^2 - u^2,\ u = 0$ $s = \frac{v^2}{2a} = \frac{20^2}{2 \times 1/15} = 3000\ m = 3\ km$ OR (a) SECOND EQUATION OF MOTION • Distance = area of trapezium [shown in graph] • Distance or s = ½ (OD+BE) x h • s = ½ (u+v)x t • s = ½ (u+u+at) x t [v = u+at by 1st of equation motion] • s = ½ (2u+at) x t • s = 2ut + at^2 2 2 • s = ut + ½ at^2  (b) $a=(v^2-u^2)/2s$ a= (0-400)/80 $a=-5m/s^2$	5