B.K. BIRLA CENTRE FOR EDUCATION

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

ANNUAL EXAMINATION 2025-26
SCIENCE (086) (SET-II)
MARKING SCHEME

Class: IX   Time: 3 hours
Date: 12/02/26   Max
Marks: 80

	Section-A (Biology)	**Marks**
1	**a) Ribosome**	1
2	**c) Cell wall**	1
3	**a) Roots and stems**	1
4	**b) Transport of water and minerals**	1
5	**c) Iron**	1
6	**c) Nitrogen fixation**	1
7	**Correct option: A**	1
8	**b) Mitochondria**	1
9	**c) Nucleus**	1

10   2

- It controls the movement of substances in and out of the cell.

- It provides protection and shape to the cell.

11   2

A tissue is a group of similar cells that work together to perform a specific function.

12

Plant Cell	Animal Cell
Cell wall present	Cell wall absent
Chloroplast present	Chloroplast absent
Large central vacuole	Small or no vacuole

13

- **Mixed cropping:** Growing two or more crops simultaneously on the same field without a definite row pattern. It reduces the risk of crop failure.

- **Intercropping:** Growing two or more crops in a definite row pattern. It improves productivity and efficient use of nutrients.

OR

Crop variety improvement is the process of developing improved crop varieties using scientific methods.
 Objectives:

1. Higher yield

2. Improved quality (nutrition, taste, etc.)

14 (i) Helps in gas exchange through stomata.

- Controls transpiration (water loss).

(ii) Chloroplasts are mainly present in the palisade mesophyll cells and guard cells.

(iii) Structural: Upper epidermis has a thick cuticle; lower epidermis has stomata.

- **Functional:** Upper epidermis protects the leaf; lower epidermis helps in gas exchange.

OR

Structure of guard cells supporting their function:

Guard cells are kidney-shaped and contain chloroplasts. Their uneven cell wall thickness helps them open and close the stomatal pore, regulating gas exchange and water loss.

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- **Nutrient management:** Use of manures and fertilizers to enrich soil fertility.

- **Irrigation:** Proper water supply at correct intervals.

- **Crop protection:** Use of pesticides and weedicides to protect crops from pests and diseases.

OR

Types of manures and fertilizers with advantages and disadvantages

Manures:

- **Types:** Compost, green manure, vermicompost

- **Advantages:** Improve soil structure, eco-friendly

- **Disadvantages:** Low nutrient content, bulky

Fertilizers:

- **Types:** Nitrogenous, phosphatic, potassic

- **Advantages:** High nutrient content, quick results

- **Disadvantages:** Cause soil and water pollution if overused

Section-B (Chemistry)

16   (b) remains same   1

17   (b) naphthalene   1
18   (b) Evaporation   1
19   (b) Distilled water   1

20   (b) 3H$_2$ 1
21   (a) Monoatomic   1
22   (b) Number of protons   1

23   1
A. Both A and R are true, and R is the correct explanation of A.

24   2

Feature	Mixture	Compound
Composition	Elements/compounds simply mixed; ratio can vary.	Elements chemically combined in a fixed ratio.
Properties	Constituents retain their original properties.	Properties are completely different from constituent elements.
Separation	Can be separated by physical methods (filtration, evaporation).	Can only be separated by chemical or electrochemical reactions.
Example	Air, Soil, Salt water.	Water, Salt .

25   3
(a) Convert to Celsius:
296 K = 296 - 273 = 23^{0}C

(i) Naphthalene balls: They undergo sublimation. They convert directly from solid state to gaseous state over time, leaving no residue.

(ii) Water is liquid at room temp: At room temperature water is between its freezing point (0^0C)and boiling point (100^0C). The intermolecular forces are strong enough to keep it fluid but not rigid.

26

3

Element Configuration (2, 8, 2):

(a) Atomic Number: 2 + 8 + 2 = 12.

(b) Valency: It has 2 valence electrons which it can lose. Valency = 2.

(c) Nature: It is a Metal (Magnesium).

OR

(Boron $^{11}_5B$):

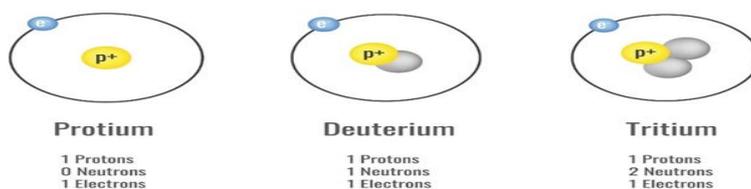Nucleons: 11 (Sum of protons and neutrons, i.e., Mass Number).

Electrons: 5 (Equal to protons in a neutral atom).

Neutrons: 11 - 5 = 6.

27

4

Isotopes of Hydrogen

Protium	Deuterium	Tritium
1 Protons	1 Protons	1 Protons
0 Neutrons	1 Neutrons	2 Neutrons
1 Electrons	1 Electrons	1 Electrons

a) (a) Isotopes

Definition: Atoms with same atomic number but different mass numbers.

b) (d) All of the above

Note: Protium, Deuterium, and Tritium are all isotopes of hydrogen.

c) Uses of Isotopes:

1. Uranium-235: Used as fuel in nuclear reactors.

2. Cobalt-60: Used in the treatment of cancer.

(Note: Iodine-131 is used for goitre treatment).

    ·   **OR**

(c) Definition: Isotopes are atoms of the same element having the same atomic number but different mass numbers. Example: Carbon-12 and Carbon-14.

28   5

  ·   (a) Formula and Mass: (i) Sodium Oxide: Formula: Na_2O

Mass: $(2 \times 23) + 16 = 46 + 16 = 62$ u

(ii) Calcium Sulphate: Formula: $CaSO_4$

Mass: $40 + 32 + (4 \times 16) = 72 + 64 = 136$ u

  (b) Atomicity:

Definition: The number of atoms constituting a molecule.

(i) Chlorine (Cl_2: Atomicity = 2 (Diatomic).

(ii) Sulphur S_8: Atomicity = 8 (Polyatomic).

  ·   **OR**

  (a) Names:

(i) Al_2S_3: Aluminium sulphide

(ii) CaO: Calcium oxide (Quicklime)

(iii) KNO_3: Potassium nitrate

(iv) Na_3P: Sodium phosphide

  (b) Elements Present:

(i) Slaked Lime $Ca(OH)_2$: Calcium, Oxygen, Hydrogen.

(ii) Potassium Sulphate K_2SO_4: Potassium, Sulphur, Oxygen.

(iii) Baking Soda $NaHCO_3$: Sodium, Hydrogen, Carbon, Oxygen.

Section-C (Physics)

29 (b) In uniform motion   1

30 (c) 100 J   1

31 A. Both A and R are true, and R is the correct explanation of A.   1
32   (a) a= (v-u)/t= 28/4= 7 ms-2   2
        (b) s= ½ at2= ½ X 7 X 16= 56 m
            OR
        (a) v= u+ at= 0.1X 2 X60= 12 m/s.
        (b) s= ½ at2= ½ X 0.1 X 3600= 180m

33 It's difficult to hold a school bag with a thin strap because the weight (force)   2
    is concentrated over a tiny contact area, creating high pressure, which
    causes pain; a wider strap distributes the same force over a larger area,
    reducing pressure and making it comfortable.

34 Loudness is our perception of sound's intensity, determined by the sound   2
    wave's amplitude, with larger amplitudes producing louder sounds, and
    also depends on the ear's sensitivity, the vibrating body's surface area,
    and distance from the source, all relating to how much energy reaches our
    ears.

35 Final velocity $(v) = 0$ 3
    (because train is brought to rest)
    Acceleration $= - 0.5$ ms^{-2}
    Using the first equation of motion,
    $$v = u + at \Rightarrow 0 = 25 + (- 0.5) \cdot t$$
    $$\Rightarrow 0.5t = 25 \Rightarrow t = \frac{250}{5} = 50 \sec$$

    Now, using the second equation of
    motion, we have

    $$s = ut + \frac{1}{2}at^2 = 25 \times 50 + \frac{1}{2} \times \left(\frac{-1}{2}\right) \times (50)^2$$

    $$= 1250 - \frac{1}{4} \times 2500 = 1250 - 625$$
    $$= 625 \, metres$$

36 (i) W= mg= 80 X10= 800N   3
    (ii) mass= 80kg, Wt= 80 X 3.7= 296 N

37   (a) Pressure is the force applied perpendicularly per unit of area, calculated as   3
            □=□/□, and its standard SI unit is the Pascal (Pa), which equals N/m².
        (b) P= F/A= mg/ l*b= 30 X10/ 0.3*0.15= 6667P
        (c) on one foot because the area will be less.

38 (i) Kinetic energy is a form of energy that an object or a particle has by   4
    reason of its motion.
    (ii) KE= ½ mv2= ½ X1000 X 400= 200000J
    (iii) becomes 4 times
    (iv) Joule (J)

39   (a) Sound is a type of energy made by vibrations. When an object   5
            vibrates, it causes movement in surrounding air molecules. These
            molecules bump into the molecules close to them, causing them to

vibrate as well. This makes them bump into more nearby air molecules.

(b)

Here,

Time taken for hearing the echo, $t = 3\ s$

Speed of sound, $v = 342\ m\ s^{-1}$

Distance travelled by the sound, $s = v \times t$

$= 342\ m\ s^{-1} \times 3\ s$

$= 1026\ m$

In 3s sound has to travel twice the distance between the reflecting surface and the source.

Hence, the distance of the reflecting surface from the source $= \dfrac{1026\ m}{2}$

$= 513\ m$

OR

(a) **Frequency (f):** Number of vibrations per second.
SI unit: **Hertz (Hz)**
Effect: Determines **pitch** of sound
Time Period (T): Time taken to complete one vibration.
SI unit: **Second (s)**
Relation: $T = \frac{1}{f}$
Amplitude (A): Maximum displacement of particles from their mean position.
SI unit: **Metre (m)**

Effect: Determines **loudness** of sound

Greater amplitude → louder sound.

(b) **Loudness:** Depends on amplitude of sound waves. Measured in **decibel (dB)**.

Pitch: Depends on frequency. Higher frequency → higher pitch.

Quality (Timbre): Helps to distinguish between sounds of same loudness and pitch produced by different sources. It depends on the waveform. Thus, even two instruments producing the same note sound different due to difference in quality.

***********************ALL THE BEST***********************