CBSE
Class IX Science
Sample Paper – 3

Time: 3 hrs **Total Marks: 80**

General Instructions:

- The question paper comprises five sections – A, B, C, D and E. You are to attempt all the sections.
- All questions are compulsory.
- Internal choice is given in sections B, C, D and E.
- Question numbers 1 and 2 in Section A are one mark questions. They are to be answered in one word or in one sentence.
- Question numbers 3 to 5 in Section B are two marks questions. These are to be answered in about 30 words each.
- Question numbers 6 to 15 in Section C are three marks questions. These are to be answered in about 50 words each.
- Question numbers 16 to 21 in Section D are five marks questions. These are to be answered in about 70 words each.
- Question numbers 22 to 27 in Section E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section A

1. Name two processes which play an important role in the oxygen cycle. (1)

2. List any two useful traits in improved crops. (1)

Section B

3. What is sublimation? Name the substances that undergo sublimation. (2)

OR

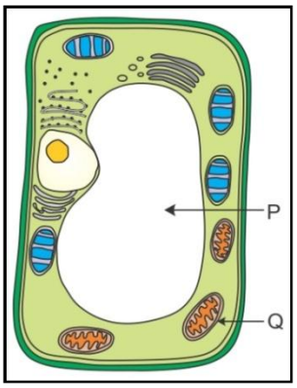
What is Brownian movement?

4. How can reverberations in a large hall or auditorium be reduced? (2)

5. Observe the figure carefully and answer the questions which follow: (2)

(a) What is the role of P in the cell?

(b) What will happen in the absence of Q in the cell?



Section C

6. Answer the following: (3)

(a) Define speed. State its SI unit.

(b) What is meant by (i) average speed and (ii) uniform speed?

(c) What is the difference between speed and velocity?

7.

(a) Give four general characters of Phylum Mollusca. (3)

(b) Write two examples.

8. (3)

(a) Why is it dangerous to jump from a moving bus?

(b) Why does a cricketer move his hand backwards while catching a ball?

9. A 0.24-g sample of a compound of oxygen and boron was found by analysis to contain 0.096 g of boron and 0.144 g of oxygen. Calculate the percentage composition of the compound by weight. (3)

10. A maid working at Sarla's place did not turn up for work as her daughter was down with diarrhoea. Hearing this, Sarla volunteered to take the child to the doctor. (3)

(a) What could be the cause for the child's illness?

(b) What immediate help can be given to the child before taking her to the doctor?

(c) What values are depicted by Sarla?

11. A 20-g bullet is travelling at a speed of 400 m/s. It strikes a 1.5-kg target which is initially at rest and remains embedded in it. What is the speed with which the target will move? (3)

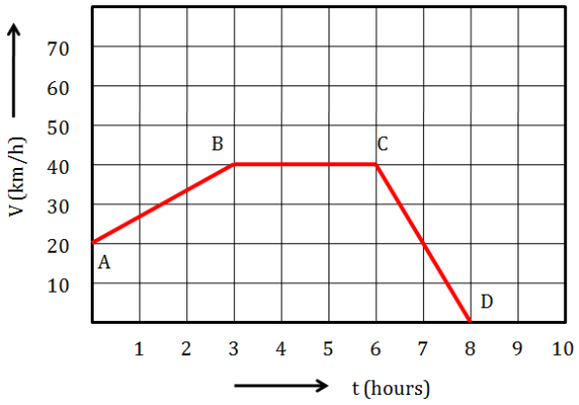
OR

The velocity–time graph for a moving body is given alongside. Find (3)

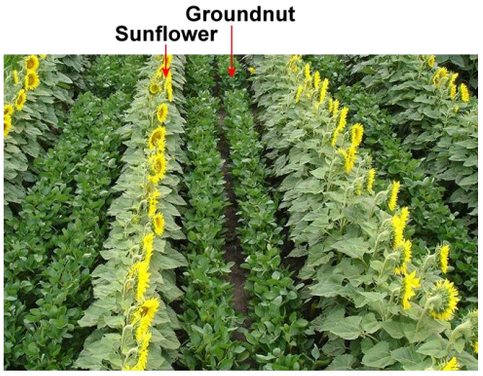
(a) Acceleration between points A and B

(b) Acceleration between points B and C

(c) Acceleration between points C and D



12. A field with sunflower and groundnut is shown below. (3)



(a) What pattern of cropping does the field show?

(b) Mention any two advantages of this type of cropping pattern.

OR

(a) How can we obtain the maximum benefit from a crop field? (3)

(b) Which of the following crops would require a minimum quantity of fertilisers for its proper growth? Why?
Paddy, Pea, Wheat, Sugarcane

13. Among the electrons revolving around the nucleus, which electron will (3)

(a) Determine the chemical properties of an element

(b) Not determine the chemical properties of an element

Give a reason for your answer.

OR

(a) If Z = 11 for element A and Z = 12 for element B, then what would be the valency of the elements? Name elements A and B.

(b) Explain isotopes with the help of suitable examples.

14. Is it possible to turn liquid into vapour without heating? Explain your view. (3)

15. Give reasons: (3)

(c) It is difficult to pull out the husk of coconut.

(d) Xylem and phloem are called complex tissues.

(e) Erythrocytes of mammals carry much more haemoglobin in them as compared to other animals.

Section D

16. (5)

(a) Define the term 'energy' of a body. What is the SI unit of energy?

(b) What are the various forms of energy?

(c) State what energy do the following objects possess:

(i) A man climbing Mount Everest

(ii) A stretched spring on the ground

(iii) A man standing on the top of a building

(iv) A formula one race car on a track

17. (5)

(a) What are decomposers?

(b) State their role in the ecosystem.

(c) In which type of plants do nitrogen-fixing bacteria reside?

(d) Explain the various forms in which carbon is found on the Earth.

OR

(a) With the help of a neat and labelled diagram, show the nitrogen cycle in nature.

(b) Describe briefly any two processes involved in the cycling of N_2 in the environment.

18. Answer the following: (5)

(a) Temperature remains constant until the whole solid changes to liquid although heat energy is constantly supplied. Why?

(b) Temperature remains constant during boiling although heat is constantly supplied. Why?

(c) Ice has lower density than water. Why?

19. Briefly describe how to separate a mixture of (5)

(a) Sulphur and sand

(b) CuO and ZnO

(c) Cream from milk

(d) Iron filings and sugar

(e) Kerosene oil and water

OR

(a) What is fractional distillation? List the two conditions essential for using fractional distillation as a method of separation of components of a mixture.

(b) Which method is used to separate a mixture of two immiscible liquids? What is the principle behind this separation technique?

20. (5)

(a) Which of the following do you think is a more basic characteristic for scientifically classifying organisms? Why?

(i) Habitat (or place where they live)

(ii) Cell type (or kind of cells they are made of)

(b) You are given specimens of Leech, *Nereis*, prawn and scorpion. All these organisms have segmented body organisation. Will you classify them in one group? If not, state the important characters based on which you will separate them into different groups.

21. (5)

(a) The Earth exerts more force on heavier bodies than on lighter bodies. Why is it that when dropped, heavier bodies do not fall faster than lighter bodies?

(b) When two equal weights of unequal volumes are balanced in air, what will happen when they are completely dipped in water? Why?

(c) An egg sinks when placed in water. What happens when salt is added to the beaker containing water?

OR

(a) Determine the value and units of the universal gravitational constant, G?

(b) A stone is dropped from the edge of the roof. It passes a window 2 m high in 0.1 s. How far is the roof above the window?

Section E

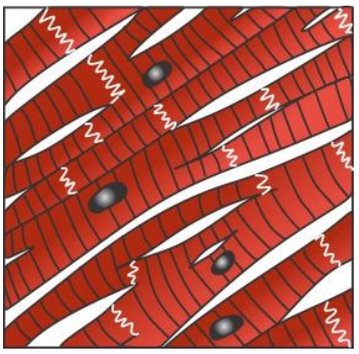
22. Observe figures A and B carefully. (2)

A

B

(a) Identify the monocot and dicot plant.
(b) Which of the given plants has a fibrous root system and parallel venation?

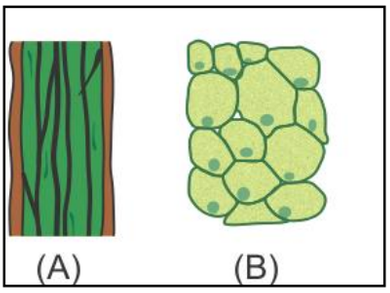
23. The given figure represents a tissue found in the human body. (2)



(a) Identify the tissue and state its location in the body.
(b) Is it voluntary or involuntary in nature?

OR

Observe the figure below and answer the questions based on it.



(a) Which of the above figures shows parenchyma cells?
(b) List any one point of difference between figures A and B.

24. A pulse was created in a stretched string of length of 5 m by four students A, B, C and D. They observed that the pulse returned after reflection at the point of creation 5 times in 10 seconds and calculated the speed as given in the table below: (2)

Student	A	B	C	D
Speed (m/s)	0.5	2.5	5	10

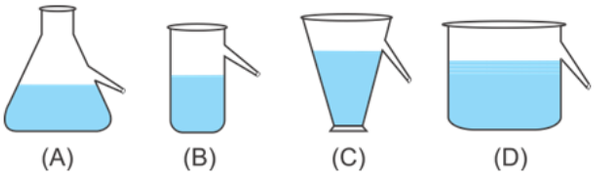
Which student has reported the speed correctly?

OR

Heena and Radhika are communicating with each other. Their friend Rima can differentiate between their voices even though she is in another room. Which characteristic of sound helps Rima to differentiate between the voices of her friends? Define it.

25. A gas jar containing air is inverted over a gas jar of bromine vapour. It is observed that after some time, the gas jar containing air also becomes completely reddish brown. Give reason for this process.

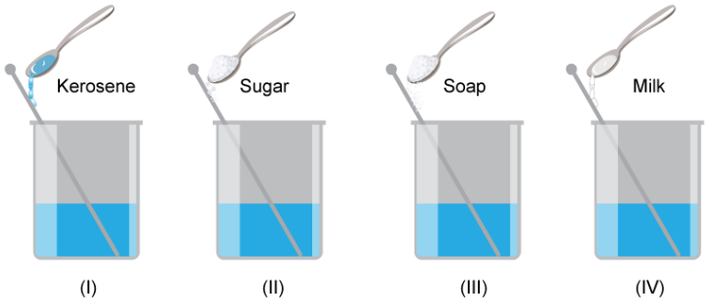
26. Four students A, B, C and D performed an experiment to establish the relation between the loss of weight of a small solid when fully immersed in tap water and the weight of water displaced by it. They used four overflow cans of different shapes to hold the water. Which student will get the desired results and why? (2)



27. You are given a mixture of carbon disulphide, benzene and water. How will the layers form and why? Suggest a method to separate them. (2)

OR

The following substances are added to water in a beaker as shown and the mixture is stirred well. Which beaker contains a true solution? Explain.



CBSE
Class IX Science
Sample Paper – 3 Solution

Section A

1. Processes which play an important role in the oxygen cycle:
(a) Photosynthesis
(b) Respiration

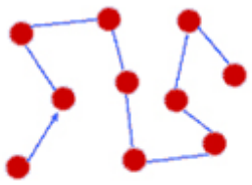
2. Some useful traits in improved crops:
(a) Higher yield
(b) Resistance to biotic and abiotic stresses

Section B

3. A change of state of a substance directly from solid to gas without changing to a liquid state (or *vice versa*) is called sublimation.
The common substances which undergo sublimation are camphor, naphthalene, ammonium chloride and iodine.

OR

The random motion of particles suspended in a fluid (liquid or gas) results from the bombardment by fast-moving atoms or molecules in the fluid (liquid or gas). This haphazard motion of particles is known as Brownian motion.



Brownian Movement of a Particle

4. Methods used for reducing reverberation in a large hall or auditorium:
(i) Panels made of sound-absorbing material can be put up on the walls and the ceiling of the hall or auditorium.
(ii) Carpets can be put on the floor to absorb sound.
(iii) Heavy curtains can be put up on doors and windows to absorb sound.
(iv) Seats can be made of materials having sound-absorbing capabilities.

5. P – Vacuole; Q – Mitochondri

(a) Vacuoles help maintain the osmotic pressure in a cell. They store toxic metabolic by-products of plant cells. They also provide turgidity and rigidity to plant cells.

(b) Mitochondria synthesise energy-rich compounds (ATP) for the cell. In the absence of mitochondria, the cell will not have energy to carry out important life processes such as photosynthesis, respiration and protein synthesis.

Section C

6.

(a) Speed is the distance travelled by a body per unit time. Its SI unit is metre per second (m/s).

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{\text{m}}{\text{s}}$$

(b)

(i) The average speed of a body is the total distance travelled divided by the total time taken to cover that distance.

(ii) Uniform speed is the speed of a body if it travels equal distances in equal intervals of time.

(c) Speed of a body tells us how fast a body is travelling, but velocity not only tells us how fast the body is travelling but also gives us the direction in which the body is travelling.

7. (a) <u>General characters of Phylum Mollusca:</u>

(i) Body is soft, bilaterally symmetrical and without appendages.

(ii) Body is divisible into the anterior head, a ventral muscular foot and a hard dorsal visceral mass. The entire body is covered by a fold of thin skin called mantle.

(iii) Respiration occurs through the gills or lungs of the mantle.

(iv) Excretion occurs by a pair of metanephridia or kidneys.

(b) <u>Examples</u>: Snail, octopus

8.

(a) When a person jumps out of a moving bus, he has high speed and will tend to continue his state of motion. Because of this, there is a possibility of injury by falling on the ground. Hence, jumping from a moving bus is dangerous.

(b) A fast-moving cricket ball has large momentum. While catching this ball, its momentum is reduced to zero. When a cricketer catches the ball, the impact can injure his hands. To prevent this, he takes his hands backwards. This increases the time taken to reduce the momentum to zero thereby decreasing the rate of change of momentum. Hence, a smaller force acts on the hands thereby preventing injury.

9. Given:

Mass of boron = 0.096 g

Mass of oxygen = 0.144 g

Mass of the sample compound (boron + oxygen) = 0.24 g

According to the law of definite proportions, boron and oxygen are in a fixed ratio in the given compound = 0.096:0.144 = 2:3

$$\%\ \text{of boron} = \frac{\text{mass of boron} \times 100}{\text{mass of compound}} = \frac{0.096 \times 100}{0.24} = 40\%$$

$$\%\ \text{of oxygen} = \frac{\text{mass oxygen} \times 100}{\text{mass of compound}} = \frac{0.144 \times 100}{0.24} = 60\%$$

10.

(a) The child must have been infected through contaminated water, food, drinks, hands, clothes or utensils leading to diarrhoea.

(b) Before being taken to the doctor, the child can be given oral rehydration solution (ORS) to restore the amount of fluids in the body and prevent dehydration.

(c) Compassion, kindness, responsible behaviour and caring attitude are some of the values depicted by Sarla.

11. Mass of the bullet, m = 20 g

$$m = \frac{20}{1000} = 0.02 \text{ kg}$$

Initial speed of the bullet, u_1 = 400 m/s

Mass of the target, M = 1.5 kg

Initial speed of the target, u_2 = 0 m/s

The bullet gets embedded in the target. So, the total mass of the bullet and the target becomes

M′ = m + M = 1.52 kg

Both objects move together with speed v_2.

According to the law of conservation of linear momentum,

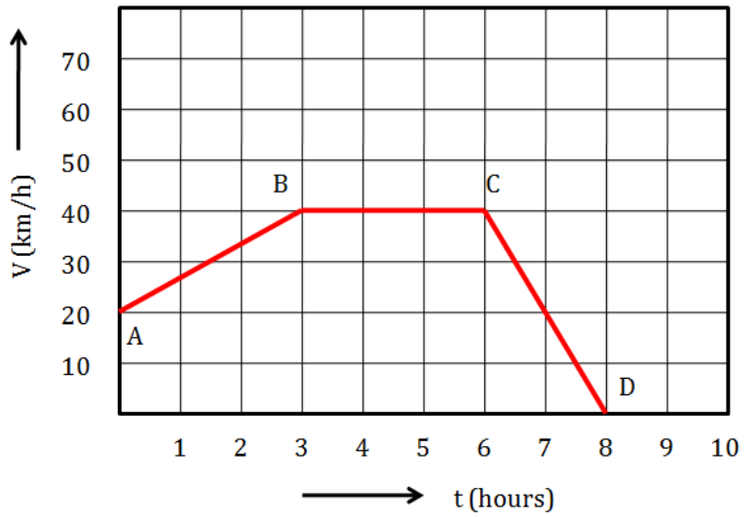
$m_1u_1 + m_2u_2 = M'v_2$

$\therefore m_1u_1 = M'v_2$

$\therefore v_2 = \frac{m_1u_1}{M'} = \frac{0.02 \times 400}{1.52}$

$\therefore v_2 = 5.26 \text{ m/s}$

OR



(a) Acceleration between points A and B will be given by the slope of line AB.

$\text{Slope} = a_{AB} = \frac{v_B - v_A}{t_B - t_A}$

$\therefore a_{AB} = \frac{40-20}{3-0} = \frac{20}{3} = 6.67 \text{ m/s}^2$

(b) Velocity of the body is constant between points B and C. Hence, the acceleration will be zero. So, $a_{BC} = 0$

(c) Acceleration between points C and D will be given by the slope of line CD.

$\text{Slope} = a_{CD} = \frac{v_D - v_C}{t_D - t_C}$

$\therefore a_{CD} = \frac{0-40}{8-6} = \frac{-40}{2} = -20 \text{ m/s}^2$

12.

(a) The field shows intercropping of sunflower and groundnut crops.

(b) <u>Advantages of intercropping:</u>

(i) It increases the productivity of crops per unit area.

(ii) It helps maintain soil fertility and allows better use of natural resources.

OR

(a) To obtain the maximum benefit from a crop field, we should adopt the following practices:
(i) Maintain soil fertility through judicious use of manures and fertilisers
(ii) Practise crop rotation
(iii) Employ cropping patterns such as mixed cropping and intercropping
(iv) Keep a check on the weed and insect pest population

(b) The pea crop would require a minimum quantity of fertilisers for its proper growth because pea is a dicot leguminous plant. The root nodules of leguminous plants contain nitrogen fixing bacteria which supply essential nutrients required for plant growth.

13.

(a) Valence electrons of an element determine the chemical properties of an element. Valence electrons have maximum energy, and hence, when they come close to the valence electrons of some other element, they either get transferred or shared.

(b) Electrons in the shell other than the valence shell do not get transferred or shared and hence do not determine the chemical properties of elements.

OR

(a) For element A, Z = 11
Electronic configuration = (2, 8, 1)
Valency = 1
For element B, Z = 13
Electronic configuration = (2, 8, 3)
Valency = 3
Element A is Sodium (Na).
Element B is Aluminium (Al).

(b) Atoms of the same element differing in the number of neutrons in their nuclei are known as isotopes. Thus, isotopes of an element have the same atomic number but different atomic mass numbers.
Example:
Isotopes of hydrogen: Protium ($_{1}^{1}H$)

Deuterium ($_{1}^{2}H$)

Tritium ($_{1}^{3}H$)

14. Yes, we can turn liquid into vapour without heating. Vaporisation of water during evaporation occurs below the boiling point under atmospheric pressure.

15.

(a)

(i) Husk of coconut is made of sclerenchymatous tissue.

(ii) Sclerenchyma cells are closely packed without any intercellular spaces.

(iii) Hence, it is difficult to pull out the husk of coconut.

(b)

(i) Xylem and phloem are conducting tissues of plants; xylem conducts water and minerals, while phloem conducts food to plant parts.

(ii) These tissues consist of more than one type of cells with a common origin.

(iii) All these cells coordinate to perform a common function.

(iv) Hence, xylem and phloem are called complex tissues.

(c)

(i) Erythrocytes of mammals are circular, biconcave, disc-like and lack nuclei.

(ii) Therefore, they have increased surface area for gaseous exchange and can accommodate much more haemoglobin in them than the RBCs of other animals.

Section D

16.

(a) Energy of a body is its ability to do work. Its SI unit is joule (J).

(b) Various forms of energy are

(i) Kinetic energy, (ii) Potential energy, (iii) Chemical energy, (iv) Heat energy, (v) Light energy, (vi) Sound energy, (vii) Electrical energy and (viii) Nuclear energy

(c)

(i) A man climbing Mount Everest will possess kinetic and potential energy.

(ii) A stretched spring on the ground will possess elastic potential energy.

(iii) A man standing on the top of a building will possess gravitational potential energy or simply potential energy.

(iv) A formula one car racing on the track will possess kinetic energy.

17.

(a) Organisms which decompose the dead remains of plants and animals are called decomposers.

(b) <u>Role of decomposers in the ecosystem:</u>

(i) They help in the cycling of nutrients in the biosphere.

(ii) They convert the available nutrients to a usable form.

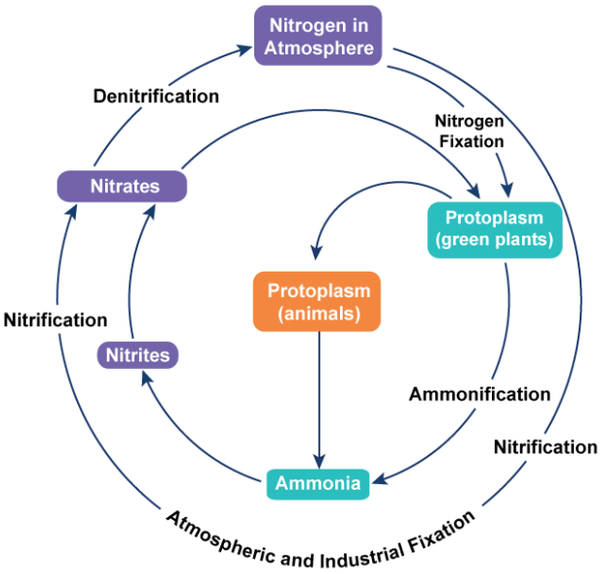
(iii) They help in complete disposal of dead animals or living things.

(c) Nitrogen-fixing bacteria such as *Rhizobium* reside in the root nodules of leguminous plants.

(d) Carbon in the elemental form occurs as diamond and graphite. Carbon in the combined state occurs as carbon dioxide, carbonates and hydrogen carbonate salts in various minerals. It occurs in carbon-containing molecules such as carbohydrates, fats, proteins, nucleic acids and vitamins.

OR

(a) Nitrogen cycle



(b) Nitrogen fixation, nitrogen assimilation, decomposition and denitrification are the four major processes involved in the cycling of N_2 in the environment.

(i) Nitrogen fixation: It involves the conversion of inert nitrogen gas to biologically stable forms. This process is performed by several free-living bacteria such as *Azotobacter*, symbiotic bacteria such as *Rhizobium* and cyanobacteria. They absorb atmospheric nitrogen and reduce it to ammonia. Ammonia combines with organic acids to produce amino acids which then form proteins. After the death of these organisms, proteins and nitrogen compounds are decomposed to form ammonia and nitrates.

(ii) Nitrogen assimilation: This process is performed by plants. They absorb nitrates and ammonium ions from the soil. Nitrate is first changed into the ammonium form. Ammonium combines with organic acids to form amino acids and other nitrogenous compounds. Amino acids give rise to proteins. Enzymes are formed from proteins. Nucleotides produce nucleic acids such as DNA and RNA. Animals obtain organic nitrogen from plants directly or through the food chain.

(a) During melting, the temperature of the liquid phase remains the same as that of the liquid phase. The heat energy supplied is utilised to destroy the crystal pattern and is stored in the liquid phase as potential energy.

(b) Heat energy supplied is utilised to destroy the intermolecular force among the molecules of the liquid and is stored as potential energy.

(c) As the volume of a substance increases, its density decreases. When water changes to ice, the space between particles increases. These spaces are larger as compared to the spaces present between the particles of water. Thus, the volume of ice becomes greater than that of water. Hence, the density of ice becomes lower than that of water. A substance with lower density than water can float on water. So, ice floats on water.

19.

(a) Mixture of sulphur and sand:

Add a solvent to the mixture of sulphur and sand. Sulphur dissolves in carbon disulphide, while sand does not. When filtered, the residue is sand. The filtrate is kept open, carbon disulphide evaporates and sulphur crystals form.

(b) Mixture of CuO and ZnO:

Add a solvent to the mixture of CuO and ZnO which dissolves only one component, e.g. sodium hydroxide. When sodium hydroxide is added to the mixture, ZnO dissolves. Filter to obtain the residue of CuO.

(c) Mixture of cream from milk:

Centrifugation is used to separate cream from milk. The milk is put in a closed container in a big centrifuge machine. When the centrifuge machine is switched on, the milk is rotated (or spun) at a high speed in its container. The centrifugal force acts on the milk and due to this, the milk separates into cream and skimmed milk. The cream, being lighter, floats over the skimmed milk and can then be removed.

(d) Mixture of iron filings and sugar:

By using a magnet, we can separate iron filings and sugar from their mixture. Iron filings will stick to the surface of the magnet and sugar will be left behind.

(e) Mixture of kerosene oil and water:

A separating funnel is used to separate the mixture of two immiscible liquids. Kerosene oil and water do not mix with each other and form two separate layers. The mixture separates into two layers according to their densities. The heavier liquid (water) forms the lower layer, whereas the lighter liquid forms the upper layer (kerosene). Thus, the water is first collected in the beaker and kerosene is collected in another beaker.

OR

(a) Fractional distillation is the method used for the separation of components of a mixture containing two miscible liquids which boil without decomposition and have sufficient difference in their boiling points.
Two conditions essential for using this method:
Two liquids must be miscible, i.e. they must totally mix with each other.
The difference between the boiling points of the liquids should be less than 25 K.

(b) A mixture of two immiscible liquids can be separated by using a separating funnel. The separation of two immiscible liquids by a separating funnel depends on the difference in their densities.

20.

(a)

(i) The more basic characteristic for scientifically classifying organisms would be the kind of cells they are made of.

(ii) It would be inappropriate to consider the place where they live as the basic characteristic of organisms and further classify them.

(iii) This is because many different kinds of organisms may live in the same habitat such as aquatic, terrestrial or aerial, but they do not necessarily belong to the same group.

(iv) For example, sponges, corals, whales, octopuses, starfish and fish are aquatic and live in the sea. However, they differ from each other in several other characteristics and hence are placed in different groups.

(b)

(i) No. Although leech, *Nereis*, prawn and scorpion have segmented body organisation, they cannot be classified in one group.

(ii) Leech and *Nereis* have metameric segmentation, closed circulatory system and unjointed appendages. They belong to Phylum Annelida.

(iii) Prawn and scorpion also have segmented body, but they have an open circulatory system, jointed appendages and chitinous exoskeleton. They belong to Phylum Arthropoda.

21.

(a) The Earth exerts more force on heavier bodies. This is because force depends on the mass of the body. However, when dropped from the same height, all the bodies take equal time to fall to the ground. This is because the acceleration with which the bodies fall is independent of the mass of the body.

(b) When an object is dipped in a liquid, a buoyant force acts on it. This force depends on the volume of the object being immersed and the density of the liquid. When two objects of equal weights and unequal volumes are immersed in water, they displace unequal amounts of water. This is because the buoyant force on each of them is unequal and as a result they will displace unequal quantities of water.

(c) An egg has a higher density than water; so, it sinks when placed in water. However, when salt is added to water, the density of water increases. Thus, the egg now floats in water because its density is comparable to the density of water plus salt.

OR

a) From the universal law of gravitation,

M_1 = Mass of the Earth

M_2 = Mass of the object

R = Radius of the Earth

F = Attractive force between the Earth and object

$F \propto M_1M_2$

$$F \propto \frac{1}{R^2}$$

$$F \propto \frac{M_1M_2}{R^2}$$

$$F = \frac{GM_1M_2}{R^2}$$

Let $M_2 = 6 \times 1024$ kg

$R = 6.4 \times 1024$ kg

$F = 1$ N

$$1N = \frac{G \times 6 \times 10^{24} \times 1}{\left(6.4 \times 10^6\right)^2}$$

$$\frac{1N \times \left(6.4 \times 10^6\right)^2}{6 \times 10^{24}} = G$$

Units of G

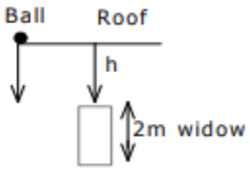
$$F = \frac{GM_1M_2}{R^2}$$

$$N = \frac{G \times Kg \times Kg}{m^2}$$

$$\frac{Nm^2}{(Kg)^2} = G$$

Units of $G = Nm^2/kg^2$

b) S = h = height
u = Initial velocity
t = Time
g = Acceleration due to gravity



Let the time taken to fall through height 'h' be 't'. So

$h = ut + \frac{1}{2}gt^2$

$h = \frac{1}{2} \times (-10) \times t^2$ $(u = 0)$

$\Rightarrow -h = -5t^2$ ... (1) (−h because the fall is downward)
Let h =(h+ 2) m and time taken is (t + 0.1)s.
$-(h + 2) = -5(t + 0.1)^2$ ... (2)
Subtracting (2) from (1),
$-2 = -5[(t + 0.1)^2 - t^2]$
$= -5[t^2 + 0.2t + 0.01 - t^2]$
$-2 = -5[0.2t + 0.01]$
$0.2t + 0.01 = 0.4$
$0.2t = 0.39$
$t = 1.95s$
Substituting in (1),
$-h = -5t^2$
$-h = -5 \times (1.95)^2$
$h = 19.0$ m
The roof is 19.0 m above the window.

Section E

22.

A – Sunflower plant; B – Onion plant

(a) Sunflower is a dicot plant, while onion is a monocot plant.

(b) Onion plant will have a fibrous root system and parallel venation because it is a monocot. Dicot plants have a tap root system and reticulate venation.

23.

(a) The given figure shows cardiac muscle tissue found in the walls of the human heart.

(b) Cardiac muscles contract and relax continuously. We do not have control over their working. Hence, they are involuntary in nature.

OR

(a) Figure B shows parenchyma cells.

(b) Differences between figure A (sclerenchyma) and figure B (parenchyma): (Any one)

Sclerenchyma	Parenchyma
1. It is composed of dead cells.	1. It is composed of living cells.
2. It consists of thick cell walls.	2. It consists of thin cell walls.
3. The cell wall is made of complex polymer lignin.	3. The cell wall is made of cellulose.
4. It is found in roots, veins of leaves and hard covering of seeds and nuts.	4. It is found in the cortex of roots, ground tissues in stems and mesophyll of leaves.

24. Speed is distance divided by time.

Distance is the length of the stretched string, d = 5 m

Time is the time taken by the pulse for 1 to-and-fro motion.

Here, the pulse travels 5 to-and-fro motions in 10 seconds.

Therefore, the time taken is 10/5 = 2 s.

Hence, the speed of the pulse is

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{5}{2} = 2.5 \text{ s}$$

Hence, student B reported the speed correctly.

OR

The characteristic of sound called quality (timbre) helps Rima to differentiate between the two voices.

The characteristic of sound which enables to differentiate between sounds of the same frequency and pitch is called quality or timbre.

25. Both air and bromine vapour are in the gaseous state and show random motion. Particles of a gas have maximum kinetic energy. They move with high speed in all directions and can exert pressure on the walls of the container. The moving particles of bromine vapour and air collide with each other and bounce about in all directions due to which they get mixed uniformly.

26. Student B will get the desired results. When a solid is immersed in a liquid, it displaces an amount of liquid equal to its volume. Students A, C and D have filled water up to the orifice of the containers. If a liquid is placed in them, it will spill over and accurate measurements would not be possible.

27. A mixture of more than two immiscible liquids is separated by using a separating funnel. When a mixture of carbon disulphide, benzene and water is put in a separating funnel, it separates into three layers. Carbon disulphide (being heavier than water) forms the bottom layer, water forms the middle layer and benzene (being the lightest) forms the top layer. On opening the stop-cock, carbon disulphide will run out first followed by water and then benzene.

OR

Beaker I contains a true solution.

A true solution is a homogeneous mixture in which two or more substances are dissolved in a solvent. When sugar is added to water, it forms a homogeneous mixture, i.e. the solute and solvent particles cannot be distinguished.