Goa Board
Class IX Science
Term 1
Sample Paper – 1 Solution

Time: 3 hrs   **Maximum Marks: 90**

SECTION A

1. **Ans**. When the cell is damaged, lysosomes burst to release the lytic enzymes which digest the entire cell. Hence, lysosomes are called suicidal bags of the cell.

2. **Ans.** When the liquid is heated, its temperature increases. Due to this, particles of liquid get enough kinetic energy to go into the vapour state. This increases the rate of evaporation.

3. **Ans.**
   (i) Force
   (ii) Gravitational constant

4. **Ans.**
   During the burning of a candle, both physical and chemical changes take place.
   - **Physical Change**
     When a candle is lit, the heat of the flame melts the solid wax to liquid wax. This signifies a physical change from the solid state to the liquid state. Also, as the wax melts, the size of the candle decreases. It then solidifies and takes a different shape.
   - **Chemical Change**
     The wax acts as a fuel when we light the candle and is basically carbon. The carbon combines with oxygen to form another chemical substance—carbon dioxide—and water.
     Also, the unburnt carbon is deposited as a black substance called soot. This signifies a chemical change.

5. **Ans.**
   When we walk on the ground, our foot pushes the ground in the backward direction (action) and the ground pushes our foot in the forward direction (reaction). This reaction helps us to move forward. However, when our foot falls on a peel of banana, the peel cannot push the ground in the backward direction as the friction is reduced. Consequently, no reaction force acts on our foot and we lose balance.

6. **Ans.**

   Two types of food requirements of dairy animals are
   (i) Maintenance requirement: Food required to support the animal to live a healthy life.
   (ii) Milk-producing requirement: The type of food required during the lactation period.

7. **Ans**.

| Parenchyma	Collenchyma
1. Cells are generally isodiametric in shape.	1. Cells are elongated in shape.
2. The cell wall is thin.	2. The cell wall is thickened as extra cellulose is deposited on the corners of the cell wall.
3. Stores and assimilates food.	3. Provides mechanical support and flexibility to the plant.

8. **Ans.**

   (i) Both air and bromine vapours are made of tiny moving particles. 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.
   (ii) This process is called diffusion.

9. **Ans.**

   Activity: To show the sublimation of ammonium chloride.
   - Take some ammonium chloride. Crush it and put it in a China dish.
   - Put an inverted funnel over the China dish.
   - Put a cotton plug on the stem of the funnel, as shown in the diagram below.
   - Now, slowly heat the China dish with the help of a Bunsen burner and observe.
   - Solid ammonium chloride on exposure to heat will directly change into the vapour state.
   - The vapours on rising in the funnel will start condensing and form crystals of ammonium chloride.
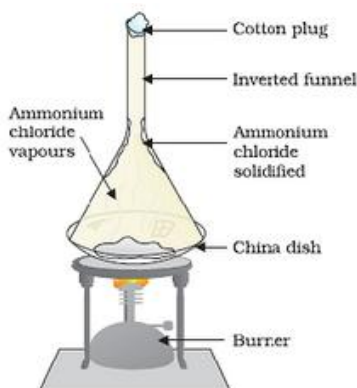
10. Ans.

(i) The government should regulate the production and supply of such medicines. There should be a proper law for sale and purchase of such medicines.

(ii) The most common way of expressing the concentration of a solution is the 'percentage method'. It refers to the 'percentage of solute' present in the solution.

(iii) Mass of glucose (solute) = 30 g

Mass of water and alcohol (solvent) = 300 − 30 = 270 g

11. Ans.

(i) Colloidal solution: Milk, blood

(ii) Suspension: Oil and water, sand and water

(iii) True solution: Sugar in water, potassium permanganate in water

12. Ans.

In the first case, when Rehan paddles:

u = 0; v = 6 m/s; t = 30 s

$$a = \frac{v-u}{t}$$
$$= \frac{6-0}{30}$$
$$= 0.2 \text{ m/s}^2$$

In the second case, when the brakes are applied:

u = 6 m/s; v = 4 m/s; t = 5 s

$$a = \frac{v-u}{t}$$
$$= \frac{4-6}{5}$$
$$= -0.4 \text{ m/s}^2$$

13. Ans.

According to the law of conservation of momentum, we have

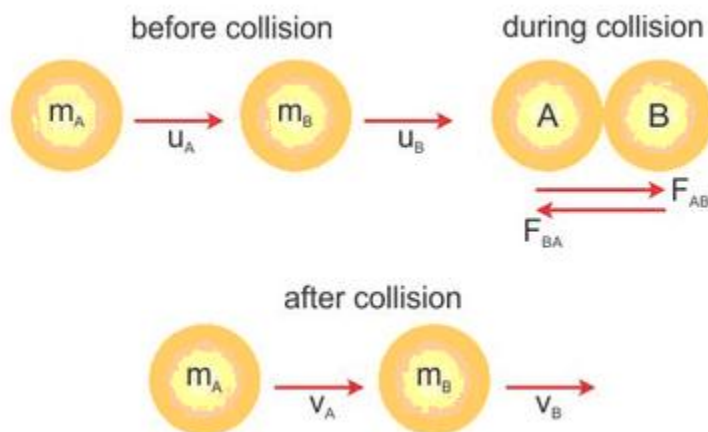Total momentum of the system before collision = Total momentum of the system after collision

$$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$
$$0.1 \times 2 + 0.2 \times 1 = 0.1 \times 1.67 + 0.2 \times v_2$$
$$0.2 + 0.2 = 0.167 + 0.2 v_2$$
$$\therefore v_2 = \frac{0.4 - 0.167}{0.2} = 1.165 \text{ m/s}$$

14. Ans.

Consider two balls A and B of masses m_A and m_B, respectively, moving in the same direction along a straight line with velocities u_A and u_B. They collide for time t. After collision, their velocities become v_A and v_B.

Force exerted by A on B is

$$F_{AB} = \text{Rate of change of momentum of B}$$

$$= \frac{m(v_A - u_A)}{t}$$

Force exerted by B on A is

$$F_{BA} = \text{Rate of change of momentum of A}$$

$$= \frac{m(v_B - u_B)}{t}$$

We assume that no other external unbalanced forces are acting on the balls.

According to Newton's third law of motion, action and reaction are equal and opposite.

$$F_{AB} = -F_{BA}$$

$$\frac{m_A(v_A - u_A)}{t} = -\frac{m_B(v_B - u_B)}{t}$$

$$m_A(v_A - u_A) = -m_B(v_B - u_B)$$

$$\therefore m_A u_A + m_B u_B = m_A v_A + m_B v_B$$

Thus, total momentum before collision is equal to total momentum after collision.

15. Ans.

Let M and m be the masses of the Earth and the apple, respectively, and r be the distance between them. Thus, the force of gravity between them is

$$F = \frac{GMm}{r^2}$$

Due to this force, acceleration in the apple is

$$a_{Apple} = \frac{F}{m} = \frac{GM}{r^2}$$

Acceleration produced in the Earth is

$$a_{Earth} = \frac{F}{M} = \frac{Gm}{r^2}$$

Therefore, we have

$$\frac{a_{Earth}}{a_{Apple}} = \frac{m}{M}$$

As m << M, so a_{Earth} << a_{Apple}

So, we are unable to observe the acceleration of the Earth towards the apple.

16. Ans.

Functions of Golgi apparatus:

(i) Material synthesised near the endoplasmic reticulum (ER) is packaged and dispatched to various targets inside and outside the cell through the Golgi apparatus.

(ii) It is involved in the storage, modification and packaging of products.

(iii) Sometimes, it also forms complex sugars from simple sugars.

(iv) It is also responsible for the formation of lysosomes (Any three functions)

17. Ans.

(i) Squamous epithelium

(ii) Cuboidal epithelium

(iii) Glandular epithelium

18. Ans.

Following practices can be implemented in order to ensure healthy life and productive livestock population:

(i) Providing shelter facilities which are well ventilated, well lighted and roofed.

(ii) Proper cleaning with the floor slightly sloping.

(iii) Regular brushing or cleaning of the shed to remove dirt and loose hair.

(iv) Provide food which includes fibre, roughage and concentrates in balanced ratios.

(v) Provision of special food to cattle during the lactation period.

(vi) Check against external parasites and skin check against internal parasites such as norms and flukes.

(vii) Vaccination against viral and bacterial diseases.

(Any six points)

19.Ans.

(a)

(i)   Fractional distillation

(ii) Chromatography

(iii) Centrifugation

(iv) Sublimation

(b) Some impurities may remain dissolved in the solution, and these contaminate the solid on evaporation; thus, crystallisation is a better technique.

(c) Immiscible liquids are separated by the process of sublimation.
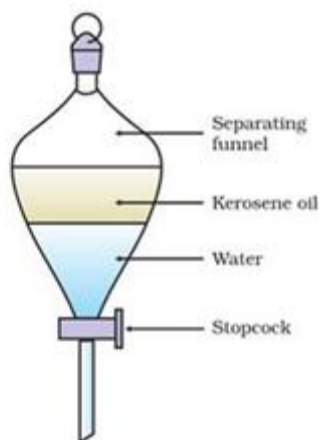
Sublimation

20.Ans.

(a) The graph represents uniformly accelerated motion.

(b) The slope of the graph gives acceleration of the object.

(c) The area under the graph represents the distance travelled by the object.

(d)
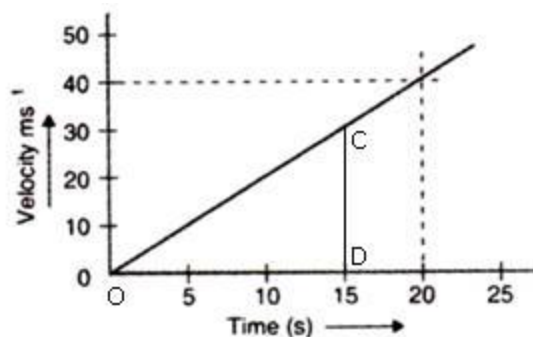
Distance = Area of right triangle ODC.

$$= \frac{1}{2} \times b \times h = \frac{1}{2} \times 15 \times 30 = 225 \text{ m}$$

21. Ans.

(a) Let m be the mass of an object moving with initial velocity u. Let a constant force F act on the object for time t so that its final velocity becomes v.

Then, initial momentum of the object P_1 = mu

Final momentum of the object P_2 = mv

Change in momentum = $P_2 - P_1$

= mv – mu

= m (v – u)

The rate of change of momentum = m (v – u)/t

According to Newton's second law of motion, the rate of change of momentum is directly proportional to the force applied.

$$F \propto \frac{m(v-u)}{t}$$

$$F = \frac{km(v-u)}{t}$$

$$F = kma$$

The unit of force is so chosen that the value of the constant k becomes one.

So, F = ma

(b) One newton is defined as the amount of force exerted on a body of mass 1 kg to produce an acceleration of 1 m/s^2.
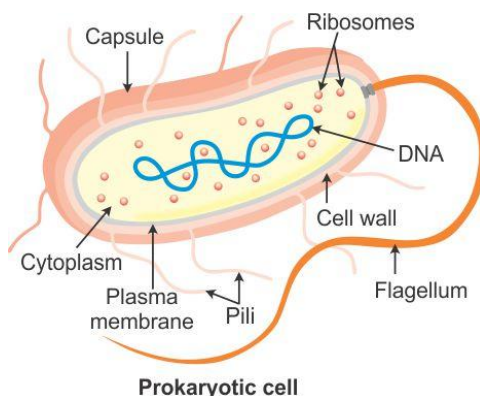
(c)

$$F_1 = 0.5 \text{ kg} \times 5 \text{ m/s}^2 = 2.5 \text{ N}$$

$$F_2 = 4 \text{ kg} \times 2 \text{ m/s}^2 = 8 \text{ N}$$

Hence, 4 kg mass at 2 m/s^2 will require a greater force.

22. Ans.

(a) <u>Prokaryotic Cell</u>:

Prokaryotic cell

(b) The organisms whose cells lack a nuclear membrane are called prokaryotes. In bacteria, the nuclear membrane is absent due to which the nuclear region is poorly developed. Such undefined nuclear region containing only nucleic acids is called nucleoid. Bacteria also lack membrane-bound cell organelles.

23. Ans.

(a) The period of milk production after the birth of a calf is called the lactation period. Breeds of cattle selected for their long lactation period are Jersey and Brown Swiss. Local breeds show excellent resistance to diseases, and foreign breeds have long duration of lactation period. The crossing of two breeds can bring both these desired quantities in young ones.

(b) Roughage is largely fibrous food used for cattle. Concentrates are low in fibre and contain relatively high levels of proteins.

24. Ans.

Properties	Solids	Liquids	Gases
Shape	Definite shape (intermolecular forces are strong)	Do not have a definite shape, takes the shape of the container	No definite shape (weak intermolecular forces)
Volume	Definite volume (spaces between the particles are fixed)	Definite volume (spaces between the particles are fixed)	No definite volume (spaces between the particles are not fixed)
Compressibility	Negligible	Negligible	High
Diffusion	Can diffuse into liquids	Diffusion is higher than solids	Highly diffusible (rate of diffusion is fastest in gases)
Fluidity or rigidity	Rigid and cannot flow from one place to another	Less rigid and can easily flow	No rigidity and can flow easily

SECTION B

25.Ans. D. Sclerenchyma tissues are long with thickened cell walls due to the deposition of lignin.

26.Ans. B. The working of a spring balance is based on the elasticity of metals.

27.Ans. C. First rises and then becomes constant. As soon as the boiling point is reached, the temperature becomes constant and does not rise as now the heat is used up in converting the liquid to vapour.

28.Ans. A. Metanil is used as an organic dye. It is used in the textile, leather and paper industries.

29.Ans. B. Sugar dissolves completely in water to form a true solution.

30.Ans. C. Solutions from test tubes A and C turn blue-black. The substance present in ` them contains starch. Rice and potato contain starch, while dal is proteinaceous.

31.Ans. B. In accordance with Newton's third law of motion, the wall also exerts an equal and opposite force on the man, i.e. 30 N.

32.Ans. C. Action and reaction forces are always equal and opposite.

33.Ans. C. When iodine solution is added to starch, a starch–iodine complex is formed which imparts blue colour to the solution.

34.Ans. A. Sheela identified it as cheek cells. The human cheek cell is an animal cell. When mounted on a slide, it clearly shows the presence of a plasma membrane, cytoplasm and nucleus.

35.Ans. Experimental setup II is correct for the determination of the boiling point of water. This is because in this arrangement, the mouth of the round bottom flask is closed with a two-holed stopper. In one hole, a thermometer is fixed, while in another, a glass tube is fixed. Further, the thermometer bulb is kept above the water level which is the correct way to keep the thermometer.

36.Ans.
(i) B. The force with two blocks F_2 will be greater than with one block F_1, i.e. $F_2 > F_1$.
(ii) If the blocks are interchanged, then no change will occur as the total weight remains the same, and hence $F_2 > F_1$.