Class IX Session 2023-24
Subject - Science
Sample Question Paper - 4

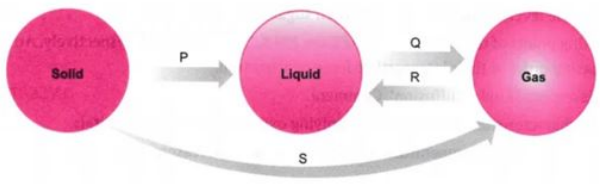
Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

1. Which of the changes is/are endothermic? **[1]**



a) P, S b) S

c) P,Q,S d) R

2. Four strips are cut from a fresh potato. The length of each strip is measured. One strip is placed in water and others in different concentrations of sugar solution. After an hour, the strips were measured again. The results are shown in the table. Which of the liquids P, Q, R and S is water? **[1]**

Liquid	Original length of strip (mm)	Final length of strip (mm)
P	75	75
Q	78	80
R	82	80
S	86	85

a) Q

b) S

c) P

d) R

3. The water drop falls at regular intervals from a tap 5 m above the ground. The third drop is leaving the tap at instant the first drop touches the ground. How far above the ground is the second drop at that instant? (Take g = 10 m S^{-2}) **[1]**

a) 2.50 m

b) 1.25 m

c) 4.00 m

d) 3.75 m

4. Which one of the following nutrients is not available in fertilizers? **[1]**

a) Potassium

b) Nitrogen

c) Phosphorus

d) Iron

5. Which of the following tissues has dead cells? **[1]**

a) Collenchyma

b) Epithelial tissue

c) Parenchyma

d) Sclerenchyma

6. Amoeba acquires its food through a process, termed **[1]**

a) plasmolysis

b) endocytosis

c) both exocytosis and endocytosis

d) exocytosis

7. Calculate the formula unit mass of $ZnCl_2$? (nearest approximation) **[1]**

a) 111 u

b) 123 u

c) 124 u

d) 137 u

8. Lignified, narrow, elongated and dead cells are found in **[1]**

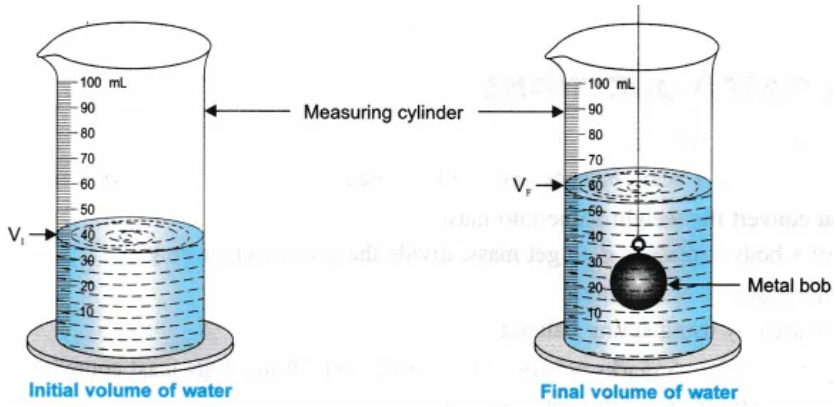
a) collenchyma

b) phloem

c) parenchyma

d) sclerenchyma

9. The water level in a measuring cylinder, before and after immersing a metal cube in it, is shown in the figure. The volume of the metal cube is: **[1]**



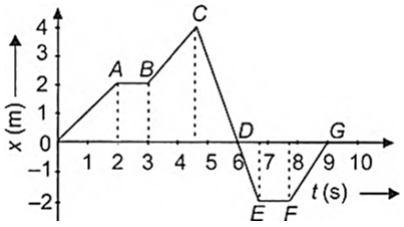
a) 18 cm^3

b) 24 cm^3

c) 20 cm^3

d) 22 cm^3

10. A dancer is demonstrating dance steps along a straight line. The position-time graph of the dancer is given here. **[1]**



The average speed for the dance step depicted by CD is

a) 1 m S^{-1}

b) 1.33 m S^{-1}

c) 0.89 m S^{-1}

d) 2.75 m S^{-1}

11. Which of the following correctly represent the electronic distribution in the Mg atom? **[1]**

a) 8, 2, 2

b) 2, 8, 2

c) 3, 8, 1

d) 1, 8, 3

12. Tendons help to connect **[1]**

a) muscle to muscle

b) muscle to bone

c) bone to cartage

d) bone to bone

13. The well defined nucleus is absent in _____. **[1]**

a) Prokaryotic cell

b) Plant cell

c) Animal cell

d) Eukaryotic cell

14. Which one is a physical change? **[1]**

a) Mixing $BaSO_4$ + NaCl

b) Mixing NH_3 and HCl

c) Burning magnesium in air

d) Adding NaCl to water

15. A food sample turned blue-black after addition of a few drops of iodine solution. This sample contains: **[1]**

a) starch

b) fat

c) protein

d) glucose

16. _____ are related to the duration of sunlight. **[1]**

a) Geotropism

b) Photoperiods

c) Pollination

d) Phototropism

17. **Assertion (A):** An object may have acceleration even if it is moving with uniform velocity. **[1]**

Reason (B): An object may be moving with uniform velocity but it may be changing its direction of motion.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

18. **Assertion (A):** Evaporation of spirit from the skin make the skin feel cool. **[1]**

Reason (R): It liberates latent heat of vaporisation from the skin.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

19. **Assertion (A):** The cells of sclerenchyma tissue are living. **[1]**

Reason (R): They are long and narrow as the walls are thickened due to the deposition of lignin.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** Isotopes are electrically neutral. **[1]**

Reason (R): Isotopes of an element have equal number of protons and electrons.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

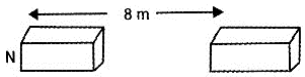
d) A is false but R is true.

Section B

21. The Jog falls in Karnataka state are nearly 20 m high 2,000 tonnes of water falls from it in a minute. Calculate the equivalent power, if all this energy can be utilised. ($g = 10\ ms^{-2}$) **[2]**

OR

A force of 7N acts on an object. The displacement is say 8 m, in the direction of the force. Let us take it that the force acts on the object through the displacement. What is the work done in this case?



22. Why is it that on increasing the wind speed the rate of evaporation increases? **[2]**

23. What is reverberation? How can it be reduced? **[2]**

24. Osmosis is a special kind of diffusion. Explain. **[2]**

25. Two persons manage to push a motor car of mass 1,200 kg at a uniform velocity along a level road. The same motor car can be pushed by three persons to produce an acceleration of 0.2 ms^{-2}. With what force does each person push the motor car? Assume that all persons push the motor car with the same muscular effort. **[2]**

OR

A batsman hits a cricket ball which then rolls on a level ground. After covering a short distance, why does the ball come to rest?

26. Draw a sketch of Bohr's model of an atom with three shells. **[2]**

Section C

27. i. Sound is produced when your school bell is struck with a hammer. Why? **[3]**

ii. A powerful sound signal sent from a ship is received again after 4.8 seconds. How deep is the ocean bottom? (Speed of sound in water = 1500 m/s).

28. An old man and a scientist were talking about a deserted house. The old man was sure that it was haunted by ghosts, but the scientist discarded the view saying no one had ever seen a ghost. The old man was annoyed and challenged the scientist about existence of atoms, sub-atomic particles which also could not be seen. **[3]**

i. Name the three sub-atomic particles and their discoverers.

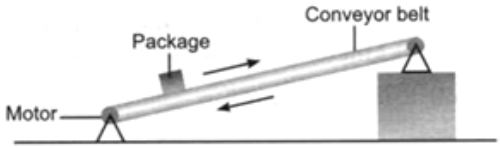
ii. Whose viewpoint do you support and why?

29. Write a short note on uniform circular motion. **[3]**

OR

A train is travelling at a speed of 90 kmh^{-1}. Brakes are applied so as to produce a uniform retardation of 0.5 ms^{-2}. Find how far the train will go before it is brought to rest.

30. Figure shows a conveyor belt transporting a package to a raised platform. The belt is driven by a motor. **[3]**



i. State three types of energy, other than gravitational potential energy, into which the electrical energy supplied to the motor is converted.

ii. The mass of the package is 36 kg. Calculate the increase in the gravitational potential energy (p.e.) of the package when it is raised through a vertical height of 2.4 m.

iii. The package is raised through the vertical height of 2.4 m in 4.4 s. Calculate the power needed to raise the package.

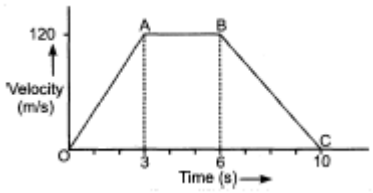
iv. Assume that the power available to raise package is constant. A package of mass greater than 36 kg is raised through the same height. Suggest explain the effect of this increase in mass on the operation of the belt.

31. The velocity-time graph of an object of mass m = 50 g is shown in the figure. Observe the graph carefully and answer the following questions. **[3]**

i. Calculate the force on the object in time interval 0 to 3 s.

ii. Calculate the force on the object in the time interval 6 to 10 s.

iii. Is there any time interval in which no force acts on the object? Justify your answer.



32. Fill in the gaps in the following table illustrating differences between prokaryotic and eukaryotic cells. **[3]**

Prokaryotic Cell	Eukaryotic Cell
1. Size. Generally small (1 – 10 μm).	1. Size. Generally large (5 – 100 μm).
2. Nuclear Region _____ and known as _____	2. Nuclear Region. Well defined and surrounded by a nuclear membrane.
3. Chromosomes. Single	3. More than one Chromosome
4. Membrane Bound Cell Organelles. Absent.	4. _____

OR

What are the colours absorbed by plants? The green light of the sunlight is blocked. How will the phytosynthesis be affected?

33. i. What will happen if cells are not properly organised in tissue? **[3]**

ii. Under certain circumstances squamous epithelium is known as stratified squamous epithelium. Justify.

Section D

34. The weight of any person on the moon is about 1/6 times that on the earth. He can lift a mass of 15 kg on the earth. What will be the maximum mass, which can be lifted by the same force applied by the person on the moon? **[5]**

OR

i. A cube of side 5 cm is immersed in water and then in saturated salt solution. In which case, will it experience a greater buoyant force? If each side of the cube is reduced to 4 cm and then immersed in water, what will be the

effect on the buoyant force experienced by the cube as compared to the first case for water. Give the reason for each case.

ii. A ball weight 4 kg of density 4000 kg $m^{-3}$is completely immersed in water of density 10^3kg m^{-3}. Find the force of buoyancy on it. (Given g = 10 ms^{-2}.)

35. Explain main functional regions of a cell with the help of a diagram. **[5]**

OR

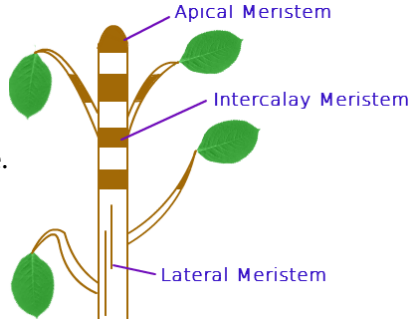
Write the main functions of atleast ten cell components.

36. Iron filings and sulphur were mixed together and divided into two parts, A and B. Part A was heated strongly while part B was not heated. Dilute hydrochloric acid was added to both the parts and evolution of gas was seen in both the cases. How will you identify the gases evolved? **[5]**

Section E

37. **Read the text carefully and answer the questions:** **[4]**

The tissue is a group of cells having similar origin, structure& function. Study of tissues is called Histology. In unicellular organism (Amoeba) single cell performs all basic functions, whereas in multi-cellular organisms (Plants and Animals) shows division of labour as Plant tissue & Animal tissues. Plant tissues are two types: Meristematic & Permanent tissue.



Meristematic tissue: The meristems are the tissues having the power of cell division. It is found on that region of the plant which grows.

Following are the types of Meristems:

The Apical meristems- It is present at the growing tip of the stem and roots and increases the length.

The lateral meristems- It present at the lateral side of stem and root (cambium) and increases the girth.

The intercalary meristems- It present at internodes or base of the leaves and increases the length between the nodes.

(i) Which tissue help in the secondary growth of the plant?

(ii) In what region of the plant does intercalary meristematic growth occur?

OR

Where does meristematic tissue mostly found in a plant?

38. **Read the text carefully and answer the questions:** **[4]**

The practice of keeping or rearing, caring, and management of honey bee on a large scale for obtaining honey and wax is called apiculture. The place where bees are raised is called an apiary. Bee-keeping requires low investment and generates additional income, hence it is done by farmers along with agriculture.

Following are the Honey bee varieties that are used for bee-keeping as follows:

Indigenous varieties	**Exotic varieties**
Apis cerana indica (Indian bee)	Apis mellifera (Italian bee)
Apis dorsata (Rock bee), Apis florae (Little bee)	Apis adamsoni (South African bee)

(i) Why bee keeping should be done in good pasturage?

(ii) Does honey bee help in pollination? Which type of flowers attracts the honey bee?

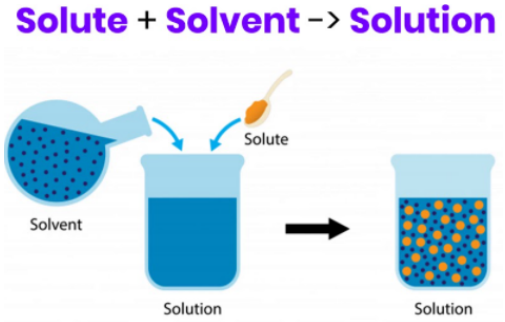
(iii) Mention the products obtained from the honey bee.

OR

What is the best season to start beehive?

39. **Read the text carefully and answer the questions:** **[4]**

Mixtures are constituted by more than one kind of pure form of matter. Sodium chloride is itself a pure substance matter. The solution is a homogeneous mixture of two or more substances. Lemonade, soda water etc. are all examples of solutions. Alloys are mixtures of two or more metals or a metal and a non-metal and cannot be separated into their components by physical methods. A solution has a solvent and a solute as its components. The component of the solution that dissolves the other component in it (usually the component present in a larger amount) is called the solvent. The component of the solution that is dissolved in the solvent (usually present in lesser quantity) is called the solute.



(i) In a water-sugar solution: Identify solute and solvent?

(ii) What is the size of the particles of a solution?

(iii) What is pure substance?

OR

What do you mean by Alloy?

Solution

Section A

1.

(d) R

Explanation: The reactions which proceed with the absorption of heat energy are called as endothermic reactions.

2. **(a)** Q

Explanation: Sugar solution is hypertonic to cell sap of potato, whereas water acts as a hypotonic solution to it. When the potato strip is placed in water, its cells will gain water by osmosis, resulting in increase in size of potato strip. When the potato strips are put in sugar solution of different concentrations, the cells will lose water resulting in decrease in the size of strip. As only potato strip placed in liquid 'Q' shows increase in length, this shows that liquid 'Q' is water.

3.

(d) 3.75 m

Explanation: Height of tap = 5 m

For the first drop, $5 = ut + \frac{1}{2}gt^2 = \frac{1}{2} \times 10t^2 = 5t^2$ or $t^2 = 1$ or t = 1 s. It means that the third drop leaves after one second of the first drop, or each drop leaves after every 0.5 s. Distance covered by the second drop in 0.5 s

$= \frac{1}{2}gt^2 = \frac{1}{2} \times 10 \times (0.5)^2 = 1.25$ m

Therefore distance of the second drop above the ground = 5 - 1.25 = 3.75 m.

4.

(d) Iron

Explanation: Plant nutrients which are commercially produced in factories are called fertilizers. Fertilizers supply important nutrients; especially nitrogen, phosphorus and potassium.

5.

(d) Sclerenchyma

Explanation: Sclerenchyma Tissue makes the plant hard and stiff, thickened due to lignin and no inter cellular space. Cells of this tissue are dead and commonly seen in the husk of coconut.

6.

(b) endocytosis

Explanation: Amoeba acquires its food through the process of Endocytosis. Actually it has cytoplasmic projections called psedupodia (false feet) that extend out of its body. It moves the pseudopodia towards the food and take it in its body through the process of endocytosis.

7.

(d) 137 u

Explanation: Formula unit mass of $ZnCl_2$ is ($66 + 35.5 \times 2 = 137$u)

The atomic mass of Zn is 66 and the atomic mass of Cl is 35.5

8.

(d) sclerenchyma

Explanation: Sclerenchyma tissue is dead simple permanent tissue of the plant. The cells of sclerenchyma are closely packed without intercellular spaces, like tiles in the mosaic floor so that, it can provide the strength, rigidity, flexibility, and elasticity to the plant to withstand various strains.

9.

(c) 20 cm^3

Explanation: 60 – 40 = 20 cm^3

10.

(d) 2.75 m S^{-1}

Explanation: Distance covered for dance step CD = 4 m

Time taken for CD is greater than 1 s but less than 2 s

Since, average speed = $\frac{\text{total distance}}{\text{total time}}$

Therefore, average speed is less than 4 m s^{-1} but greater than 2 m s^{-1}. Hence, option (C) is the only possibility.

11.

(b) 2, 8, 2

Explanation: Atomic number of magnesium = 12

Therefore number of electrons = 12

Thus, electronic configuration of magnesium is Magnesium = 2,8,2.

12.

(b) muscle to bone

Explanation: A tendon is a fibrous connective tissue that attaches muscle to bone. Tendons may also attach muscles to structures such as the eyeball.

13. **(a)** Prokaryotic cell

Explanation: Prokaryotic cells do not have a nuclear membrane, and cell organelles are also not well enveloped.

14.

(d) Adding NaCl to water

Explanation: Adding of common salt (NaCl) to water is physical change as no new substance is formed and no heat is evolved during the addition of salt in water. Also, salt can be obtained by evaporation.

15. **(a)** starch

Explanation: Many different food groups contain a carbohydrate known as starch. Using an iodine solution, you can test for the presence of starch. When starch is present, the iodine changes from brown to blue-black or purple.

16.

(b) Photoperiods

Explanation: Photoperiod is the period of direct exposure to sunlight by a plant. The movement of a plant part in response to light is called photoperiod.

17. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: The uniform motion only means that the object is moving at a constant speed but its direction of motion may be changing at in the case of uniform circular motion. Hence, acceleration is produced in uniform motion due to changes in velocity.

18.

(c) A is true but R is false.

Explanation: Evaporation of spirit from skin make the skin feel cool because it absorbs latent heat of vaporisation from the skin.

19.

(d) A is false but R is true.

Explanation: The cells of sclerenchyma tissue are dead. They are long and narrow as the walls are thickened due to the deposition of lignin. The walls of cells are so thick that there is no internal space inside the cell.

20. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: Both A and R are true and R is the correct explanation of A.

Section B

21. Here, Height, h = 20 m, and mass of waterfall in a minute = 2000 tonn = 2000 $\times$ 10^3 kg = 2 $\times$ 10^6 kg

Hence, Power = $\frac{mgh}{t}$ = $\frac{2\times10^6\times10\times20}{60}$ W = $\frac{4}{6}\times10^7$ W = 6.6 $\times10^6$ W.

OR

Force = 7 N

Displacement = 8 m

Work done = Force $\times$ Displacement

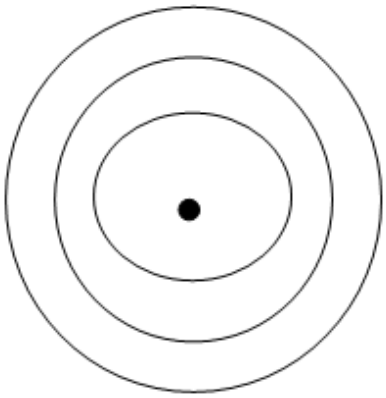
= 7 $\times$ 8 = 56 J

22. When the speed of wind increases, then they blow away with them the water vapour in the air and as a result rate of evaporation will increase because the surrounding air will be able to receive more vapours and hence evaporation increases.

23. Reverberation is the repeated multiple reflections of sound in any big enclosed space. It can be reduced by covering the ceiling and walls of the enclosed space with some absorbing materials like fibre board, loose woollens etc.
24. Osmosis is a special kind of diffusion. In both the phenomena, there is a movement of particles from the region of higher concentration to a region of lower concentration. However, in case of osmosis, the movement is of "solvent particles" from a less concentrated "solution" and the movement is through a semi-permeable membrane.
25. Given mass = 1,200 kg, acceleration produced = 0.2 ms^{-2}
    Force exerted by two persons simply overcome the force of friction between the ground and the motor car. The force of third person imparts acceleration to the motor car; so force exerted by third person, F =ma = 1,200 $\times$ 0.2 = 240 N
    ∴Force exerted by each person = 240 N

    OR

    The ball slow down and comes to rest due to the opposing forces of air resistance and friction between the ball and the ground.
26. Bohr's model of an atom with three shells:
    The three stationary orbits are designated as K-shell (nearest to the nucleus), M-shell and N-shell.
    The atom with three shells can accommodate a maximum of 2, 8 and 18 electrons respectively.

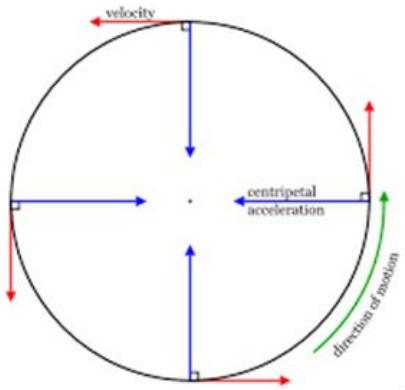


Section C

27. i. Sound is produced when a material body is made to vibrate with some mechanical energy. So, school bell is struck with a hammer to make it vibrate and thus the sound is produced.
    ii. The time taken by the signal to reach the bottom and come back is 4.8 s
    Speed of sound in water = 1500 m/s
    Depth of the ocean h
    h = $\frac{v \times t}{2}$
    h = $\frac{1500 \times 4.8}{2}$
    h = 1500 $\times$ 2.4
    h = 3600 m
28. i.

Particles	Discoverer
Electrons	J.J. Thomson
Protons	Rutherford
Neutrons	Chadwick

    ii. View point in support of scientist as he discourages superstition.
29. When a body moves in a circle, it is called circular motion. When the velocity of an object changes, we say that the object is accelerating. The change in the velocity could be due to change in its magnitude or the direction of the motion or both.



If the athlete is running along a hexagonal shaped path ABCDEF, the athlete will have to change his direction six times while he completes one round. If the athlete moves with a velocity of constant magnitude along the circular path, the only change in his velocity is due to the change in the direction of motion.

The motion of the athlete moving along a circular path is an example of an accelerated motion.

The circumference of a circle of radius r is given by 2πr. If the athlete takes t seconds to go once around the circular path of radius r, the velocity v is given by

v = $\frac{2\pi r}{t}$

When an object moves in a circular path with uniform speed, its motion is called uniform circular motion.

OR

Here, initial velocity, u = 90 kmh^{-1}

= $\frac{90km}{1h}$

= $\frac{90\times1000m}{60\times60s}$

= 25 ms^{-1}

Acceleration, a = -0.5 ms^{-2}

Final velocity v = 0

From the equation of motion, 2as = $v^2 - u^2$

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

= $\frac{0-(25ms^{-1})^2}{2\times(-0.5ms^{-2})}$

= $\frac{-625m^2s^{-2}}{-1.0ms^{-2}}$

= 625 m

The train will go 625 m further, after applying the brakes.

30. i. a. Kinetic energy of belt or the package.
    b. Heat energy
    c. Sound energy

    ii. m = 36 kg, h = 2.4 m, g = 10 m/s^2

    G.P.E.= $m \times g \times h$

    $= 36 \times 10 \times 2.4$

    = 864J

    iii. $power = \frac{W}{t}$

    $power = \frac{864}{4.4}$

    = 196.36 W

    iv. Mass is increased and power is constant, so increase in potential energy of mass is greater. Also, as mass is increased, speed is reduced and hence time taken by the conveyor is longer.

31. i. Given mass, m = 50 g = $\frac{50}{1000}$kg.

    Acceleration during intervals 0 to 3 s = a_1 = $\frac{v-u}{t}$ = $\frac{120-0}{3}$ = 40 m/s^2

    According to Newton's second law of motion : Force, F_1 = ma = $(\frac{50}{1000}) \times 40$ = 2 N

    ii. Acceleration during intervals 6 to 10 s = a_2 = $\frac{v_2-v_1}{t}$ = $\frac{0-120}{(10-6)}$ = -$\frac{120}{4}$ = -30 m/s^2

    Similarly, Force, F_2 = ma_2 = $\frac{50}{1000}\times$(-30) = -1.5 N.

iii. Time interval in which no force acts on the object ='3's - '6' s i.e A to B.
This is because in this interval, the velocity of object is constant i.e. 120 m/s .
Hence, Acceleration= '0' m/s^2. Therefore, F= '0' N.

32.

Prokaryotic Cell	Eukaryotic Cell
1. Size. Generally small (1 – 10 μm).	1. Size. Generally large (5 – 100 μm).
2. Nuclear Region Poorly defined due to absence of nuclear envelope and known as Nucleoid	2. Nuclear Region. Well defined and surrounded by a nuclear membrane.
3. Chromosomes. Single	3. More than one Chromosome
4. Membrane Bound Cell Organelles. Absent.	4. Membrane bound cell organelles are present.

OR

Plants absorb all the colours in the spectrum. The plants reflect back the green light because of which they appear green in colour. Therefore, photosynthesis will not be affected if green light is blocked.

33. i. Different organisms whether unicellular or multicellular need to perform many functions in the body such as respiration, digestion, locomotion. In multicellular organisms, cells present in a group and specialized in one particular function form a tissue. Some tissues help in growth, while others in locomotion and some in body movement. So, if cells are not organized in these tissues, then a highly organized and specialized process will become disorganized. There will be no coordination in the functioning of the cells and body.

ii. The squamous epithelial cells line the cavities of the mouth, oesophagus, alveoli, and blood vessels. This tissue gives protection against mechanical injury and also blocks the entry of germs. If the squamous epithelium is arranged in many layers, it is known as a compound squamous tissue called the stratified squamous epithelium. We find these kinds of tissues in the skin and also the lining of the oesophagus.

Section D

34. Since the weight of any person on the moon is about 1/6 times that on the earth, hence acceleration due to gravity at the moon is 1/6 of that on earth. This means that by applying the same force a person can lift six times heavier objects on the moon than what he could lift on the earth. So, the maximum mass which can be lifted by the same force applied by the person on the moon is 6 $\times$ 15 kg = 90 kg.

OR

i. The cube will experience a greater buoyant force in saturated salt solution than in water because density of saturated salt solution is more than the density of water. If each side of the cube is reduced to 4 cm, it will result in reduction in volume of the cube. Hence, the buoyant force experienced by it will reduce in water.

ii. Buoyant force = weight of displaced water
= density of water $\times$ volume of displaced water $\times$ g
= 1000 $\times$ $\frac{4}{4000}$ $\times$ 10 [$\because$ volume = $\frac{weight}{density}$]
= 10 N

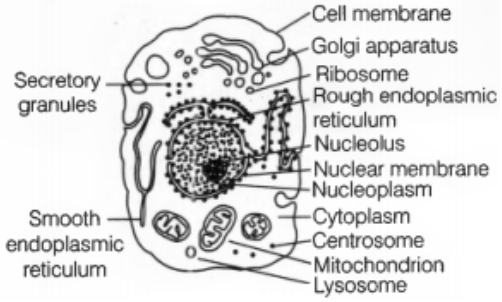
35. The plasma membrane, cytoplasm, and nucleus are three main functional regions of a cell.

i. Plasma membrane: It is a thin, selectively permeable membrane, covering the cell and is made up of lipids and proteins.

ii. Cytoplasm: It is aqueous material containing a variety of cell organelles along with non-living inclusions.

iii. Nucleus: It is the control centre of a cell. It contains the cells hereditary information (DNA).

The diagram of the eukaryotic cell is:-



OR

The ten cell components are:

i. **Plasma membrane:** It acts as a semipermeable membrane and allows only selective substances to pass through it.
ii. **Chromosomes:** To carry hereditary characters of an organism from one generation to another.
iii. **Lysosomes:** Breakdown of unwanted macromolecules is the main function of these organelles.
iv. **Ribosomes:** These help in protein synthesis.
v. **Nucleus:** Control centre of the cell. It contains cellular DNA (genetic information) in the form of genes.
vi. **Mitochondria:** The main function of mitochondria in aerobic cells is the production of energy by the synthesis of ATP.
vii. **Nucleolus:** Biosynthesis of ribosomal RNA (rRNA) and acts as a platform for protein synthesis.
viii. **Cell wall:** It provides protection and rigidity to the plant cell.
ix. **Chloroplasts:** These are the sites of photosynthesis within plant cells.
x. **Endoplasmic reticulum:** Serves as channels for transport of materials.

36. **Part A:** $Fe + S \xrightarrow{\Delta} FeS$

$FeS + 2HCL(dil.) \rightarrow FeCl_2 + H_2S\uparrow$

Here H_2S gas is produced, which is identified by its characteristic smell of rotten eggs.

Part B: $Fe + S \rightarrow mixture$

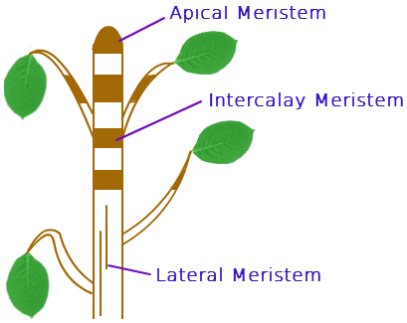
$Fe + S + 2HCL(dil.) \rightarrow FeCl_2 + H_2\uparrow$

Here H_2 gas is produced. Hydrogen gas is tested by bringing a burning matchstick near the mouth of the test tube. It burns with a pop sound and water is formed.

Section E

37. **Read the text carefully and answer the questions:**

The tissue is a group of cells having similar origin, structure& function. Study of tissues is called Histology. In unicellular organism (Amoeba) single cell performs all basic functions, whereas in multi-cellular organisms (Plants and Animals) shows division of labour as Plant tissue & Animal tissues. Plant tissues are two types: Meristematic & Permanent tissue.



Meristematic tissue: The meristems are the tissues having the power of cell division. It is found on that region of the plant which grows.

Following are the types of Meristems:

The Apical meristems- It is present at the growing tip of the stem and roots and increases the length.

The lateral meristems- It present at the lateral side of stem and root (cambium) and increases the girth.

The intercalary meristems- It present at internodes or base of the leaves and increases the length between the nodes.

(i) Cambium tissue help in the secondary growth of the plant.

(ii) Between mature tissue segments, intercalary meristematic growth occurs.

OR

Meristematic tissues are mostly found at the apices of root and shoot.

38. **Read the text carefully and answer the questions:**

The practice of keeping or rearing, caring, and management of honey bee on a large scale for obtaining honey and wax is called apiculture. The place where bees are raised is called an apiary. Bee-keeping requires low investment and generates additional income, hence it is done by farmers along with agriculture.

Following are the Honey bee varieties that are used for bee-keeping as follows:

Indigenous varieties	**Exotic varieties**
Apis cerana indica (Indian bee)	Apis mellifera (Italian bee)
Apis dorsata (Rock bee), Apis florae (Little bee)	Apis adamsoni (South African bee)

(i) Bees need quality nectar to produce honey. A good pasturage consists of plenty of flowers that can be used by bees to get quality nectar. This increase the quality as well as the quantity of the bees. If bees are confined to only a single variety of flowers for nectar honey quality will have a similar taste and consistency. Most farmers make honey obtained from single nectar.

(ii) Yes, honey bee helps in pollination. The bright-coloured flowers attract the honey bee.

(iii) Besides honey, other products of bee-keeping are bee wax, bee venom, propolis, and royal jelly.

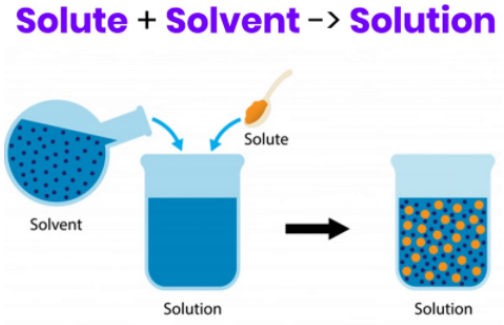
OR

Spring season is best to start a beehive.

39. **Read the text carefully and answer the questions:**

Mixtures are constituted by more than one kind of pure form of matter. Sodium chloride is itself a pure substance matter. The solution is a homogeneous mixture of two or more substances. Lemonade, soda water etc. are all examples of solutions. Alloys are mixtures of two or more metals or a metal and a non-metal and cannot be separated into their components by physical methods. A solution has a solvent and a solute as its components. The component of the solution that dissolves the other component in it (usually the component present in a larger amount) is called the solvent. The component of the solution that is dissolved in the solvent

(usually present in lesser quantity) is called the solute.



(i) Water is solvent and sugar is solute.

(ii) 1 nm in diameter

(iii) Pure substances are substances that are made up of only one kind of particle and have a fixed or constant structure.

OR

The meaning of the term ‘alloy’ is a substance formed from the combination of two or more metals. Alloys can also be formed from combinations of metals and other elements. ex- steel.