



CLASS: IX  
DATE:21/09/2023

MAX. MARKS: 80  
TIME: 3 HOURS

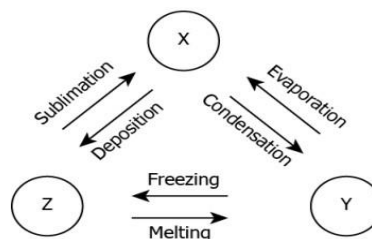
**General Instructions:**

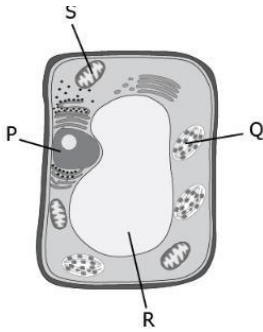
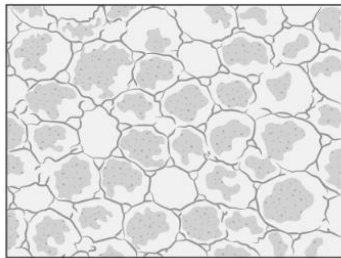
- This question paper consists of 39 questions in 5 sections.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section A** consists of 20 objective type questions carrying 1 mark each.
- Section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

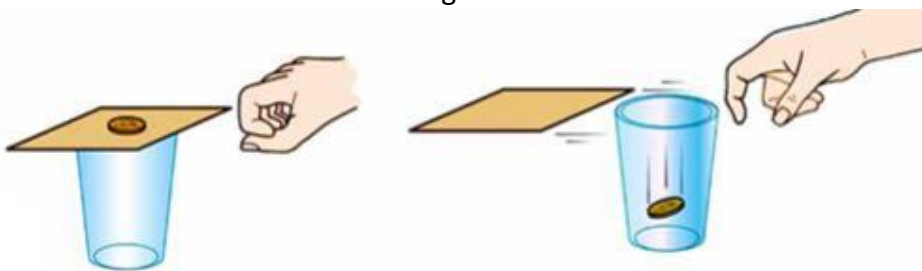
**SECTION – A**

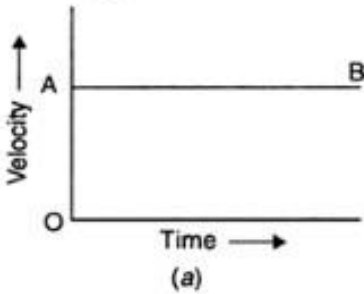
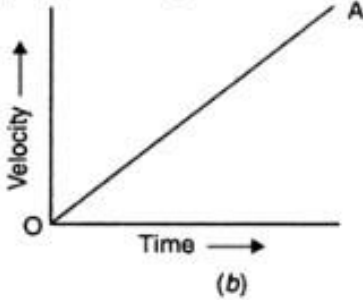
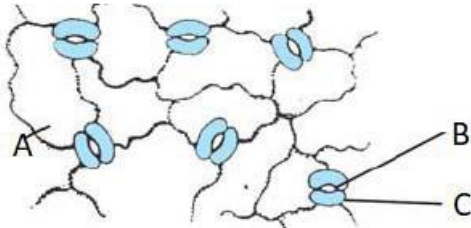
Select and write one most appropriate option out of the four options given for each of the questions 1 - 20

Q.No	Questions	Marks
1	In a controlled experimental setup involving water, various states of matter are observed at different temperatures. With this context in mind, identify the state of matter with the minimum kinetic energy: a) Particles of ice below 0°C b) Particles of water at 0°C c) Particles of water at 100°C d) Particles of steam at 100°C	1
2	The property to flow is unique to fluids. Which one of the following statements is correct? a) Only gases behave like fluids b) Gases and solids behave like fluids c) Gases and liquids behave like fluids d) Only liquids behave like fluids	1
3	Teena visited an LPG unit and found that the gas can be liquified at specific conditions of temperature and pressure. Help her to identify the correct set of conditions. a) High temperature and low-pressure b) High temperature and high pressure c) Low temperature and high-pressure d) Low temperature and low pressure	1
4	40 g of common salt is dissolved in 320 g of water. The mass percentage of salt is a) 11.1% b) 15% c) 10% d) 12.5%	1
5	The image shows three substances that can change from one physical state to another by different processes. Identify X, Y, and Z?  a) X - gas, Y - liquid, Z – solid b) X - liquid, Y - solid, Z - gas c) X - gas, Y - solid, Z - liquid d) X - solid, Y - gas, Z - liquid	1



6	In the realm of mixtures, the distinction between true solutions, colloids, and suspensions is crucial. With this context in mind, identify which of the following mixtures can be classified as a true solution: a) Sand and water b) Soap and water c) Milk and water d) Alcohol and water	1
7	The particles of colloidal solution can be separated by a) Evaporation b) Sublimation c) Centrifugation d) Distillation	1
8	In plant cells, many substances important for life are stored in a) plastids b) mitochondria c) vacuoles d) lysosome	1
9	The image shows a plant cell. Which part is responsible for the generation of energy in the cell? 	1
10	A class of students were shown a microscopic slide of a permanent plant tissue for a test. Which statement made by the student is correct about the tissue shown? 	1
11	Santi observes that the tree near her house is growing more in width than height. Name the tissue which is responsible for this type of growth? a) Apical b) Intercalary c) Lateral d) Both apical and intercalary	1
12	Which of the following are usually digested or degraded by lysosomes? a) ATP molecules b) Oxygen molecules c) Old organelles of the cell d) Carbon dioxide molecules	1
13	A block is at rest on a table. A girl applies a force towards the right. The applied force is equal to the frictional force between the block and the surface. What will happen to the block? a) it starts rotating b) it does not move c) it will start sliding towards left d) it will start sliding towards right.	1
14	The area under the velocity-time graph of a body gives: a) speed of the body b) retardation of the body c) acceleration of the body d) displacement of the body	1

15	In the given list of plant tissues, dead cells are present in: (i) parenchyma (ii) sclerenchyma (iii) collenchyma (iv) bark a) i and ii                      b) ii and iii                      c) ii only                      d) ii and iv	1
16	Organelle other than nucleus, containing DNA is a) endoplasmic reticulum                      b) Golgi apparatus c) mitochondria                      d) lysosomes	1
<p><b>Q. no 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</b></p> <p><b>a) Both A and R are true and R is the correct explanation of A</b>  <b>b) Both A and R are true and R is not the correct explanation of A</b>  <b>c) A is true but R is false</b>  <b>d) A is False but R is true</b></p>		
17	Assertion: Evaporation causes cooling. Reason: During evaporation heat is taken from surroundings to overcome inter molecular force of attraction.	1
18	Assertion: A cell swells up when kept in a hypotonic solution. Reason: More water molecules enter the cell than they leave.	1
19	Assertion: Mass is a measure of inertia of the body in linear motion. Reason: Greater the mass, greater is the force required to change its state of rest or uniform motion in a rectilinear path.	1
20	Assertion: Permanent tissue is composed of mature cells. Reason: Meristematic tissue is a group of actively dividing cells.	1
<p><b>SECTION – B</b></p> <p>Q. no. 21 to 26 are very short answer questions.</p>		
21	List two points to prove that tincture of iodine is a true solution.	2
22	a) Name the phenomenon which helps fresh water unicellular organisms (e.g., Amoeba) continuously gain water in their bodies. Also name the organ by which these organisms throw out excess of water from their bodies. b) Give one example in plants where similar phenomenon is used to gain water.	2
23	Are plastids present in animal cells? Give the names and functions of two common plastids present in plants.  <b>OR</b> Explain your observation in the following way, with reasons involved in the process: a) Salt is applied to raw mango pieces. b) Dried raisins are kept in water for few hours.	2
24	In the figure given below a card is flicked with a push. It was observed that the card moves ahead while the coin falls into the glass.   a) Give reason for the above observation. b) State the law involved in this case.	2

25	<p>What type of force is acting in cases shown by the v-t graphs given below? Justify your answer.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(a)</p> </div> <div style="text-align: center;">  <p>(b)</p> </div> </div> <p style="text-align: center;"><b>OR</b></p> <p>a) Action and reaction forces are equal and opposite, but they do not cancel each other. Why?  b) When a sailor jumps out of a boat in the forward direction, the boat moves backward. Explain the reason for this observation.</p>	2
26	<p>Give reason:</p> <p>a) Meristematic cells have prominent nucleus and dense cytoplasm but they lack vacuole.  b) Intercellular spaces are absent in sclerenchymatous tissues.</p>	2
<p><b>SECTION - C</b>  Q.no. 27 to 33 are short answer questions.</p>		
27	<p>a) What produces more severe burns, boiling water or steam? Give reason for your answer.  b) State which property of gas is used in supplying oxygen cylinder to hospitals?</p>	3
28	<p>Pooja added some chalk powder to a beaker containing water. After shaking the beaker vigorously, she kept it undisturbed for 5 minutes and observed carefully. What type of mixture is prepared by Pooja? Give reason to justify your answer also write any two properties of the above mixture.</p> <p style="text-align: center;"><b>OR</b></p> <p>Differentiate between mixtures and compounds (3 points)</p>	3
29	<p>Give any two differences and one similarity between mitochondria and chloroplasts.</p>	3
30	<p>Observe the diagram given below and answer the following questions:</p> <div style="text-align: center;">  </div> <p>a) Identify the structure in the diagram and name the tissue where it is found.  b) What is the significance of B in plants?  c) Out of the cells A and C in the above diagram, which cell helps in the closing and opening of B? Write the name of the cell.</p>	3
31	<p>A motorcar of mass 1200 kg is moving along a straight line with a uniform velocity of 90 km/h. Its velocity is slowed down to 18 km/h in 4 s by an unbalanced external force. Calculate:</p> <p>a) the acceleration  b) the change in momentum  c) the magnitude of the force required.</p>	3
32	<p>State Newton's universal law of gravitation and derive the expression for the force between two objects of mass <math>m_1</math> and <math>m_2</math> separated by a distance 'd'.</p>	3

33	<p>Observe the following velocity-time graph of a body in motion and answer the questions that follow.</p> <p>a) Which part of the graph represents uniform motion of a body?  b) Which part of the graph represents uniform retardation of a body?  c) Calculate the acceleration of the body from A to B.  d) What is the displacement of the body in the first 6 hours of the motion?</p>	3
----	--	---

**SECTION – D**

Q.no. 34 to 36 are long answer questions

34	<p>a) 20 g of sodium chloride is dissolved in 100 m L of water. How will you test whether the given solution is saturated or unsaturated at the given temperature?  b) Calculate the amount of water required to prepare 500 g of 2.5 % solution of sugar.  c) Suggest a method by which we can increase the solubility of the saturated solutions.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) You are given two samples of water labelled as ‘A’ and ‘B’. sample ‘A’ boils at 100 °C and sample ‘B’ boils at 102 °C. Which sample of water will not freeze at 0 °C? Comment.  b) Identify the dispersed phase and dispersing medium of the colloids given below:  i) Rubber    ii) Butter  c) Classify each of the following as a physical or chemical change.  i) Drying of a shirt in the sun.                            ii) Churning of milk cream to get butter  iii) Burning of kerosene in a lantern                    iv) Sublimation of ammonium chloride</p>	5
----	--	---

35	<p>Observe the above diagram and answer the following questions:  a) Identify and name the structures which are embedded in the nucleoplasm?  b) What is the function of the part labelled A in the nucleus?  c) Mention the change that occurs in part C during cell division?  d) State the significance of the part labelled D in the diagram.  e) Which structure transmits heredity information from parents to offspring?</p> <p style="text-align: center;"><b>OR</b></p>	5
----	--	---

	<p>Answer the following questions based on <b>Endoplasmic reticulum</b>.</p> <p>a) Which type of endoplasmic reticulum helps in detoxification in the liver cells?</p> <p>b) Name two organelles which will not be formed if endoplasmic reticulum is absent from the cell.</p> <p>c) Explain membrane biogenesis.</p> <p>d) Give any two differences between the two types of Endoplasmic reticulum.</p>	
36	<p>a) When do the distance and displacement of a moving object have the same magnitude?</p> <p>b) The displacement of a moving object in each interval of time is zero. Would the distance travelled by the object also be zero? Justify your answer.</p> <p>c) Why is uniform circular motion known as an accelerated motion?</p> <p>d) An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at the end of 2 minutes 20 s?</p> <p style="text-align: center;"><b>OR</b></p> <p>a) Define uniform acceleration.</p> <p>b) What is the acceleration of a body moving with uniform velocity?</p> <p>c) Write any two differences between speed and velocity.</p> <p>d) A car travels from stop A to stop B with a speed of 30km/h and then returns to A with a speed of 50km/h. Find the average speed of the car.</p>	5
<p><b>SECTION - E</b></p> <p>Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.</p>		
37	<p>The heating curve of a pure substance 'X' at 1 atmospheric pressure is shown below:</p> <p>(a) Mention the physical state of the substance at points P, Q, R and S.</p> <p>(b) What does the line a b represent? What is the boiling point of the substance in Kelvin scale?</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) What does the line c d represent? What is the freezing point of the substance in °C?</p>	4
38	<p>Xylem is the tissue responsible for supporting the plant and long-distance transport of water and nutrients. This tissue consists of 4 different elements. The tracheids do not have end openings like the vessels do, but their ends overlap with each other, with pairs of pits present. The pit pairs allow water to pass horizontally from cell to cell. Phloem tissue is responsible for translocation. The substances travel along sieve elements, but other types of cells are also present. The end walls of the sieve element do not have large openings but are full of small pores where cytoplasm extends from cell to cell. These porous connections are called sieve plates. Despite the fact that their cytoplasm is actively involved in the conduction of food materials, sieve-tube members do not have nuclei at maturity.</p>	4

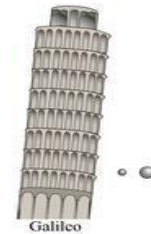
- a) Why are xylem and phloem considered to be complex permanent tissue?  
 b) Name the cells which are found both in xylem and phloem.  
 c) Give any two differences between xylem and phloem.

**OR**

- c) Name the living cells of xylem and phloem tissue.

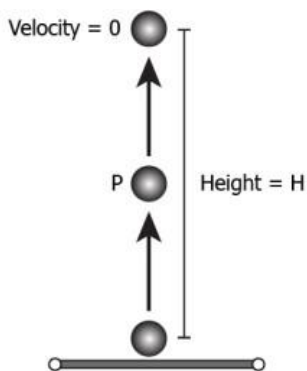
39

As part of Galileo's exploration to understand how the Earth makes objects fall and what impacts the speed with which they fall, he is said to have conducted an experiment where he dropped a heavy and a light object from the same height at the same time. He observed that both objects reached the ground at the same time. The assumption made here was that there is no air resistance.



4

- a) Gravitational force acts on all objects in proportion to their masses. Why then, a heavy object does not fall faster than a light object?  
 b) A ball is thrown vertically upwards as shown. The ball reaches a height, H. What is the acceleration **a**, of the ball at point P?



- c) Two objects of mass  $m_1$  and  $m_2$  having the same sizes are dropped simultaneously from heights  $h_1$  and  $h_2$  respectively. Find out the ratio of time they would take to reach the ground.

**OR**

- c) A stone is allowed to fall from the top of a tower 100 m high and at the same time, another stone is projected vertically upwards from the ground with a velocity of 25 m/s. Calculate when the two stones will meet.

**\*\*\*\*\*THE END\*\*\*\*\***