



INDIAN SCHOOL AL WADI AL KABIR

**PRE-MIDTERM** (2023 - 24)

Class:IX

Sub: SCIENCE (086)

Max Marks: 30

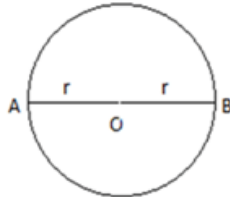
Date:30.05.2023

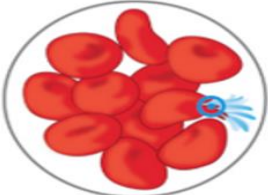

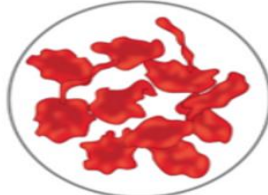
Set - 2

Time : 1 hour

**General Instructions:**

- i) All the questions are compulsory.
- ii) The question paper has five sections and 14 questions.
- iii) Section–A has 6 questions of 1 mark each; Section–B has 2 questions of 2 marks each. Section–C has 2 questions of 3 marks each. Section–D has 1 question of 5 marks and Section E has 3 case based questions of 3 marks each.
- iv) Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

NO	QUESTIONS	MARKS
<b>SECTION A</b>		
1	<p>A particle is moving in a circular path of radius <math>r</math>. The displacement after half a circle would be:</p>  <p>(a) Zero (b) <math>\pi r</math> (c) <math>2r</math> (d) <math>2\pi r</math></p>	1
2	<p>A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement?</p> <p>(a) Water, air, wind (b) Air, sugar, oil (c) Oxygen, water, sugar (d) Salt, juice, air</p>	1

3	<p>Observe the figure given below and choose the correct sequence –</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Fig i</p> </div> <div style="text-align: center;">  <p>Fig ii</p> </div> <div style="text-align: center;">  <p>Fig iii</p> </div> </div> <p>a) Fig i. Hypotonic solution, Fig ii. Hypertonic solution, Fig iii. Isotonic solution  b) Fig i. Hypertonic solution, Fig ii. Isotonic solution, Fig iii. Hypotonic solution  c) Fig i. Hypertonic solution, Fig ii. Hypotonic solution, Fig iii. Isotonic solution  d) Fig i. Hypotonic solution, Fig ii. Isotonic solution, Fig iii. Hypertonic solution</p>	1
<p><b>For question numbers 4, 5 and 6, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:</b></p> <p>a) Both A and R are true, and R is correct explanation of the assertion.  b) Both A and R are true, but R is not the correct explanation of the assertion.  c) A is true, but R is false.  d) A is false, but R is true.</p>		
4	<p><b>Assertion (A):</b> The ratio of the average velocity and average speed of a body is always greater than 1  <b>Reason(R):</b> The average speed is always greater than average velocity</p>	1
5	<p><b>Assertion (A):</b> A gas does not have fixed shape.  <b>Reason(R):</b> In gases, the particles are close to each other and less space between the particles.</p>	1
6	<p><b>Assertion (A):</b> Plasma membrane is selectively permeable.  <b>Reason(R):</b> Plasma membrane allows some molecules to pass through it more easily than others.</p>	1
<b>SECTION B</b>		
7	<p>Give reasons  (i) A gas fills completely the vessel in which it is kept.  (ii) Salt and sugar when kept in different jars take the shape of the jars, yet they are classified as solids.</p>	2
8	<p>Why the cell is called the structural and functional unit of life?  OR  Why is the plasma membrane, called a selectively permeable membrane?</p>	2
<b>SECTION C</b>		
9	<p>(i) List any two properties that liquids have in common with gases.  (ii) When sugar crystals dissolve in water, the level of water does not rise appreciably. Explain.</p>	3

	OR	
	(i) List any two characteristics of particles of matter. (ii) Distinguish between solids and gases in tabular form under the following characteristics: (a) Interparticle force of attraction (b) Fluidity	
10	a) Draw a labelled diagram of prokaryotic cell. b) Write any two difference between prokaryotic cell and eukaryotic cell. c) Give one example of a prokaryotic cell.	3
<b>SECTION D</b>		
11	a) Define acceleration. (1) b) Is acceleration, a scalar or vector quantity? Justify your answer. (1) c) What is the difference between a scalar and vector quantity? (1) d) A body starts from rest and gains a velocity of $10\text{ m/s}$ in 5 s. What is its acceleration? (2)  OR a) Define displacement of a body. (1) b) Is displacement a scalar or vector quantity? Give a reason. (1) c) What is the difference between distance and displacement? (1) d) A stone is thrown from the top of a building of height $20\text{ m}$ . The stone reaches a maximum height of $10\text{ m}$ and finally touches the ground. What is the total displacement and distance covered by the stone? (2)	5
<b>SECTION E</b>		
12	Uniform speed and uniform velocity are two quantities that seems to be the same but are different with different meanings and definitions. Speed is the measure of how much distance an object has covered during its motion in a given time .While velocity is the measure of how much distance an object has covered in a specific direction during its motion in a given time.  Using this data answer following questions.  (i) Is it possible in a straight line motion, a particle have zero speed and a non - zero velocity? Explain your answer  (ii) A car travels with a speed of $50\text{ km/h}$ towards north and then with the same speed towards East . Does this body possess acceleration. Explain your answer.  (iii) A ball hits a wall with a velocity of $30\text{ m/s}$ and bounces back with the same speed, What is the change in velocity of the ball?	3
13	When a person opens a bottle of perfume in one corner of a large room, it doesn't take very long for the scent to spread throughout the entire room. Molecules of the perfume evaporate and the vapour spreads out to fill the entire space.  (i) Define diffusion	3

	(ii) Explain the rate of order of diffusion in solids liquids and gases. (iii) State the effect of temperature on diffusion.	
14	<p>Take three peeled potato halves and scoop each one out to make potato cups. One of these potato cups should be made from a boiled potato. Put each of the potato cup in a trough containing water. Put one teaspoon of sugar in cup A, keep cup B empty and put one teaspoon of sugar in the boiled potato cup C. Keep these setup for three hours. It is observed that water gathers in cup A, but water does not gather in cup B and cup C.</p> <p>The diagram shows three potato cups labeled Cup A, Cup B, and Cup C, each placed in a trough of water. Cup A is made of fresh peeled potato and contains a hallow filled with sugar solution. Cup B is also made of fresh peeled potato and contains an empty hallow. Cup C is made of boiled peeled potato and contains a hallow filled with sugar. Labels indicate 'Fresh peeled potato cup' for A and B, and 'Boiled peeled potato' for C. Arrows point to 'Sugar solution' in A, 'Sugar' in C, and 'Fresh peeled potato cup' for B.</p> <p>i. Explain why water gathers in the hallowed portion of cup A. ii. Why is the potato cup B necessary for this experiment? iii. Explain why water does not gathers in the hallowed portion of cup B and cup C.</p>	3

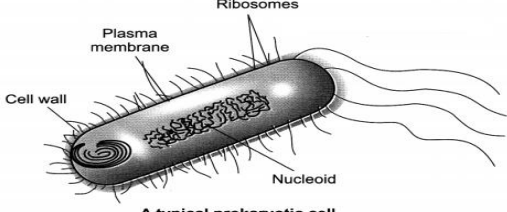
**MARKING SCHEME**

NO	QUESTIONS	MARKS
<b>SECTION A</b>		
1	(c) 2r	1
2	(c) Oxygen, water, sugar	1
3	d) Fig i. Hypotonic solution, Fig ii. Isotonic solution, Fig iii. Hypertonic solution	1
4	(d) Assertion is incorrect, reason is incorrect.	1
5	A is true and R is false	1
6	a) Both assertion and reason are true and the reason is the correct explanation of assertion.	1
<b>SECTION B</b>		
7	(i) There is no force of attraction between the gas particles. These are thus free to move and occupy all the space available to them. (ii) The shape of individual crystals of salt and sugar remain fixed even when they are put in jars of different shapes.	1 1

8	<p>A cell is capable of carrying out all life processes, such as nutrition, excretion, respiration, etc. Hence it is called as the functional unit of life. The cell is the smallest unit of life and all the living beings are made up of cells. Hence a cell is called the structural unit of life.</p> <p><b>(any relevant points)</b></p> <p>The cell membrane is called selectively permeable as it only allows specific molecules to pass. Only specific molecules like water and gaseous molecules can pass through the cell membrane directly. It stops the flow of other molecules towards the two sides.</p>	<b>(2 marks)</b>
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**SECTION C**

9	<p>(i) Liquids and gases do not have a fixed shape, liquids and gases are fluids.</p> <p>(ii) There is space between the particles of matter. Sugar particles get into the space between water particles.</p> <p style="text-align: center;">OR</p> <p>(i) Any two characteristics</p> <p>(ii)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 30%;"></td> <td style="width: 30%;">Interparticle force of attraction</td> <td style="width: 30%;">fluidity</td> </tr> <tr> <td>Solids</td> <td>strong</td> <td>Rigid</td> </tr> <tr> <td>gases</td> <td>Weak/negligible force</td> <td>Fluid</td> </tr> </table>		Interparticle force of attraction	fluidity	Solids	strong	Rigid	gases	Weak/negligible force	Fluid	<p>1</p> <p>1+1</p>
	Interparticle force of attraction	fluidity									
Solids	strong	Rigid									
gases	Weak/negligible force	Fluid									

10	<div style="text-align: center;">  <p>A typical prokaryotic cell</p> </div> <p>Any two differences</p> <p>Any one example bacteria/ Cyanobacteria/ Blue green algae)</p>	<p>½ mark for correct diagram</p> <p>½ mark for each label</p> <p>any two</p> <p>½ X 3 = 1½ marks</p> <p>(½ + ½ = 1 mark)</p> <p>½ mark for the example</p> <p>(½ + ½ + ½ = 1½ marks)</p> <p>(1½ + 1½ = 3 marks)</p>
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**SECTION D**

11	<p>a) Acceleration is the rate of change of velocity</p> <p>b) Acceleration is a vector quantity</p> <p>c) A scalar quantity is a quantity that has only magnitude. E.g. length, area, volume, speed, mass, density etc. On the other hand, a vector</p>	<p>1</p> <p>1</p> <p>1</p>
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	<p>quantity has both magnitude and direction. E.g. displacement, velocity, acceleration, momentum, force etc.</p> <p>d) Initial velocity = 0  Final velocity = <math>10\text{ms}^{-1}</math>  Time = 2s  So, acceleration = <math>\frac{10-0}{2} = 5\text{ m/s}^2</math></p> <p style="text-align: center;">OR</p> <p>a) Displacement is defined as the change in position of an object.  b) It is a vector quantity</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Parameters</th> <th style="width: 35%;">Distance</th> <th style="width: 35%;">Displacement</th> </tr> </thead> <tbody> <tr> <td>Definition</td> <td>The total or complete path travelled by an object.</td> <td>The shortest distance between the final position and the initial position of the motion of the object.</td> </tr> <tr> <td>Magnitude</td> <td>It can never be negative, always positive.</td> <td>It can be positive, negative or zero, depending on the context.</td> </tr> <tr> <td>Type of quantity</td> <td>It is a scalar quantity.</td> <td>It is a vector quantity.</td> </tr> </tbody> </table> <p>c)  d) Displacement = 20m and distance = 40m</p>	Parameters	Distance	Displacement	Definition	The total or complete path travelled by an object.	The shortest distance between the final position and the initial position of the motion of the object.	Magnitude	It can never be negative, always positive.	It can be positive, negative or zero, depending on the context.	Type of quantity	It is a scalar quantity.	It is a vector quantity.	<p>2</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p>
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### SECTION E

12	<p>i) No. It is not possible for an object to have zero speed but non-zero velocity. It is because, velocity means speed with direction</p> <p>ii) Yes, because the direction changes .Because of the change in direction ,velocity also changes.</p> <p>iii) <math>U = +30\text{m/s}</math>, <math>V = -30\text{m/s}</math> or  change in velocity = <math>V - U = -60\text{m/s}</math> or any answer other than zero</p>	<p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p>1</p>
13	<p>(i) Diffusion is the process of intermixing of two different types of matter on their own.</p> <p>(ii) The order of the rate of diffusion is Solid &lt; liquid &lt; gas. This is due to the fact that in gaseous state particles move freely and have greater space between each other as compared to solid and liquid. So, they can diffuse easily. Similarly, liquids can diffuse easily compared to solids.</p> <p>(iii) The rate of diffusion increases with the increase in temperature</p>	<p>1</p> <p>1</p> <p>1</p>
14	<p>i) Because of the process of endosmosis (osmosis).  ii) The potato cup B necessary for this experiment as it acts a iii)control as a control for comparing the results  iii)Cup B because it is a control setup or it does not contain hypertonic solution. Cup C is boiled so osmosis does not occur in dead cells</p>	<p>1</p> <p>1</p> <p>(<math>\frac{1}{2} + \frac{1}{2}</math>)</p>