

CLASS-IX
MID TERM EXAMINATION (2023-24)
SCIENCE
SET- A2

Time Allowed: 3hr

Max Marks: 80

General Instructions :

1. This question paper consists of 39 questions in 5 sections and has 11 printed sheets.
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 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 5 marks each. Answers 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

Select and write one most appropriate option out of the four options given for each of the questions 1-14.

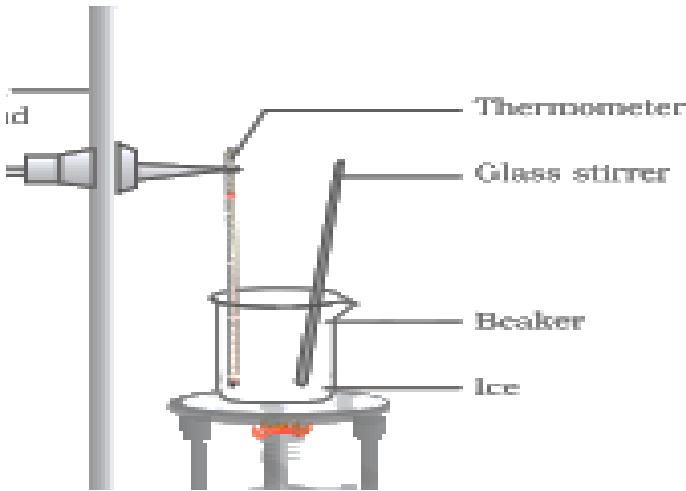
QNo	Questions	Marks
1	In all the three states of water (i.e. ice, liquid and water vapour) , chemical composition of water: (a) is very different (b) remains same (c) sometimes same and sometimes different (d) none of the above	1
2	On converting 25°C, 38°C and 66°C to Kelvin scale, the correct sequence of temperature will be: (a) 298 K, 311 K and 339 K (b) 298 K, 300 K and 338 K (c) 273 K, 278 K and 543 K (d) 298 K, 310 K and 338 K	1
3	In which of the following conditions, the distance between the molecules of hydrogen gas would increase? (i) Increasing pressure on hydrogen contained in a closed container	1

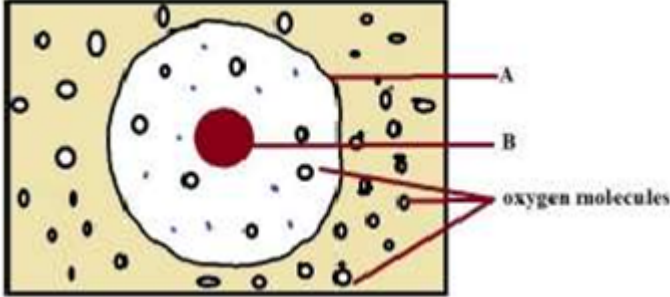
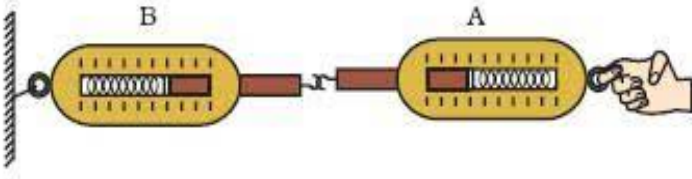
	(ii) Some hydrogen gas leaking out of the container (iii) Increasing the volume of the container of hydrogen gas (iv) Adding more hydrogen gas to the container without increasing the volume of the container (a) (i) and (iii) (b) (i) and (iv) (c) (ii) and (iii) (d) (ii) and (iv)	
4	Tincture iodine has antiseptic properties. This solution is made by dissolving: (a) Iodine in potassium iodide (b) Iodine in Vaseline (c) Iodine in water (d) Iodine in alcohol	1
5	Which of the following are homogeneous in nature? (i) ice (ii) wood (iii) soil (iv) air (a) (i) and (iii) (b) (ii) and (iv) (c) (i) and (iv) (d) (iii) and (iv)	1
6	An example of liquid metal and liquid non-metal is (at room temperature): (a) Gallium, mercury (b) Mercury, chlorine (c) Mercury, bromine (d) Bromine, sulphur	1
7	Which of the following statements are true for pure substances? (i) Pure substances contain only one kind of particles (ii) Pure substances may be compounds or mixtures (iii) Pure substances have the same composition throughout (iv) Pure substances can be exemplified by all elements other than nickel (a) (i) and (ii) (b) (i) and (iii) (c) (iii) and (iv) (d) (ii) and (iii)	1

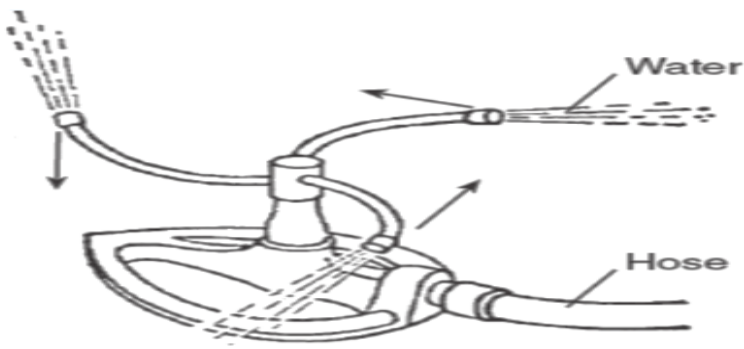
8	Which of the following tissues is made up of dead cells? (a) Parenchyma (b) Sclerenchyma (c) Collenchyma (d) Epithelial tissue	1
9	Cell wall is not present in (a) Bacterial cell (b) Onion peel cell (c) Rhoeo leaf cell (d) Human cheek cell	1
10	Find the odd one out. (a) Bacteria, (b) <i>Amoeba</i> (c) <i>Chlamydomonas</i> (d) Rat	1
11	Tissue is a group of similar kinds of cells specialized to perform a particular function in the body. Presence of tissues in a multicellular organism ensures: (a) Faster development (b) Division of labour (c) Higher reproductive potential (d) Body strength	1
12	Out of the following, which cell is likely to burst when kept in a hypotonic solution? (a) Onion peel. (b) Bacterial cell (c) De-shelled egg (d) Yeast	1
13	A passenger facing in the direction of a moving train tosses a coin which falls behind him. It means that motion of the train is (a) retarded (b) accelerated (c) uniform (d) along circular tracks .	1
14	The distance-time graph of a body is parallel to the time axis. The body must be (a) in uniform motion (b) at rest (c) in uniformly accelerated motion (d) in zig-zag motion	1

15	The slope of velocity-time graph represents a physical quantity which has the unit (a) m/s^2 (b) m^2 (c) m (d) m/s	1
16	In the relation $F = G \frac{M m}{d^2}$, the quantity G (a) depends on the value of g at the place of observation (b) is universal constant of nature (c) is greatest at the surface of the earth (d) is used only when the earth is one of the two masses.	1
<p>QNo 17 to 20 are Assertion - Reasoning questions These consist of two statements are given- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: (a) Both A and R are true, and R is the 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>		
17	Assertion(A) :A solution of table salt in a glass of water is homogeneous. Reason(R): A solution having different composition throughout is homogeneous.	1
18	Assertion(A): A living cell does not have the capacity to perform basic functions. Reason(R): The shape and size of cells are related to the specific function they perform.	1
19	Assertion(A): The growth of plants occurs only in certain specific regions. Reason(R):The dividing tissue, also known as meristematic tissue, is located only at these points.	1
20	Assertion(A): If the distance between two bodies of mass m_1 and m_2 is increased by a factor of 5 ,the gravitational force is reduced to $1/25$ of its initial value. Reason(R) :The gravitational force is inversely proportional to the square of the distance between two bodies.	1
<p style="text-align: center;">SECTION B</p> <p style="text-align: center;">Q No 21 to 26 are very short answer questions</p>		
21	Identify any four processes of interconversion out of A, B, C, D, E and F as shown in the following diagram.	$0.5 \times 4 = 2$

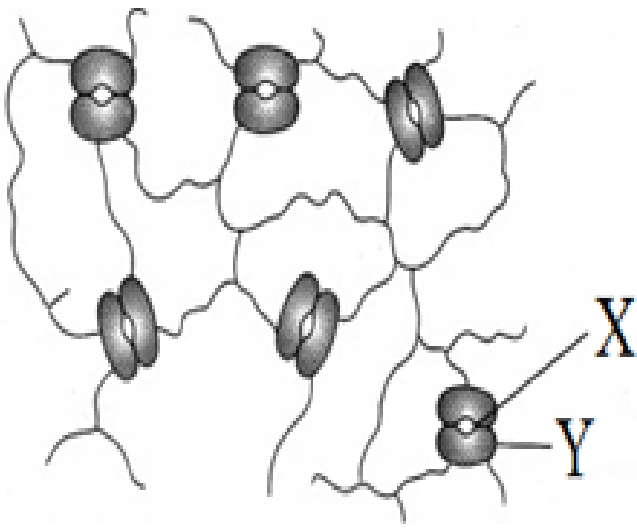
22	<p>The given figures depict the three types of simple permanent tissues in plants. Name them. Also specify the structural feature (visible in the diagram) that helped you in their identification.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> P Q R </div>	0.5*4=2
23	<p>Which cell organelle is called the powerhouse of the cell? How many membranes does it have and how are they different from each other ?</p>	0.5*4=2
24	<p>Draw a prokaryotic cell and label any two parts .</p>	1+1
25	<p>Differentiate between average speed and average velocity (two points)</p> <p style="text-align: center;">OR</p> <p>Differentiate between distance and displacement (two points)</p>	2
26	<p>Velocity- time graph of a moving particle of mass 1kg is shown in figure.</p>	2

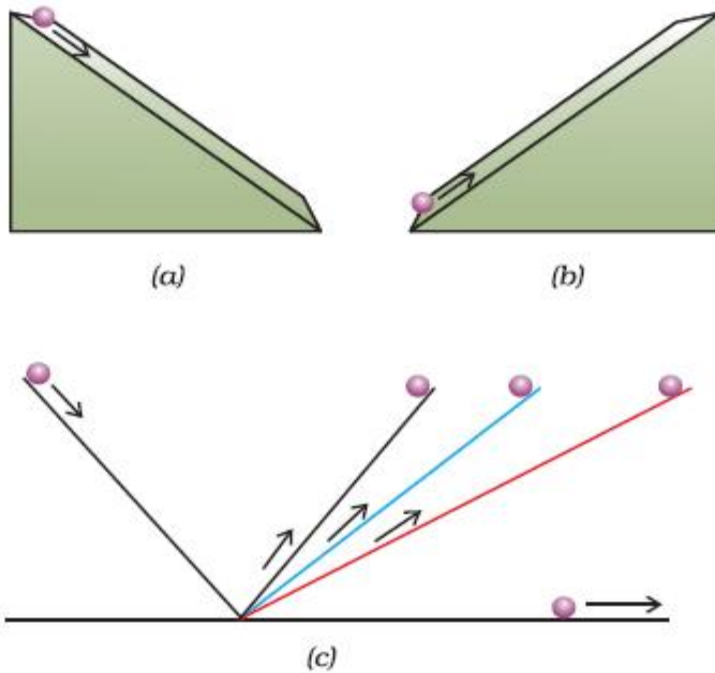
	<p>(a) Is any unbalanced force acting on the moving particle? Justify your answer.</p> <p>(b) What is the SI unit of force?</p>	
<p style="text-align: center;">SECTION C Q No 27 to 33 are short answer questions</p>		
27	 <p>(i) Why does the temperature of the thermometer remain constant in the above situation ?</p> <p>(ii) Arrange the following substances in the decreasing order of melting points: Ice, Iron , sugar</p> <p>(iii) Kinetic energy of particles of water in three vessels A, B and C are E_A, E_B and E_C respectively and $E_A > E_B > E_C$. Arrange the temperatures, T_A, T_B and T_C of water in the three vessels in increasing order.</p>	1+1+1=3
28	<p>(i) Give any one example of the Tyndall effect observed in your surroundings.</p> <p>(ii) Smoke and fog both are aerosols. In what way are they different?</p> <p style="text-align: center;">OR</p>	1+2= 3
28	<p>(i) Define the term ‘solubility’ in relation to a solution. How does it change with the change in temperature?</p> <p>(ii) How many grams of sodium carbonate is needed to make 8 % mass by mass percentage of sodium carbonate solution if the total mass of the solution is 160 g?</p>	2+1=3
29	<p>Name the following/ give the term</p> <p>(a) Chemical found in the walls of cork cells that makes them impervious to gases and water.</p> <p>(b) Tissue that helps aquatic plants float.</p> <p>(c) The shrinkage or contraction of the contents of the cell away from the cell wall,</p>	1+1+1

	when a plant cell is kept in a hypertonic solution.	
29	<p style="text-align: center;">OR</p> <p>Name the two types of conducting tissues in plants. Differentiate between them on the basis of materials transported and the direction of transport.</p>	1+2
30	<p>Observe the diagram given below and answer the questions that follow:</p>  <p>a) Identify the structure marked A. b) How can you tell it is an animal cell and not a plant cell? Give one reason. c) Oxygen will diffuse into the cell in the diagram. Why? (Use information from diagram)</p>	1+1+1
31	<p>(a) What is uniform circular motion? (b) Consider the motion of an athlete in a circular path. Is it an accelerated motion? If yes then, What is the direction of an acceleration produced in an athlete ? (c) If the athlete takes t seconds to go once around the circular path of radius r, write down an expression for its speed "v".</p>	3
32	<p>(a) Look at the diagram above and answer the following questions:</p>  <p>When the force is applied through the free end of the spring balance A, the reading on the spring balance A is 20 gwt. What will be the reading shown by the spring balance B ?</p> <p>(b) Water sprinkler used for the grass lawns that begin to rotate as soon as water is supplied. Explain how it works.</p>	3

	 <p>(c) Name and state the law involved in the above cases (a) and (b) .</p>	
33	<p>(a) Amit buys a few gram of gold at the poles as per the instruction of one of his friends. He hands over the same when he meets him at the equator. Will the friend agree with the weight of gold bought when measured using a spring balance? If not, why?</p> <p>(b) How much would a 70 kg man weigh on the moon? What would be his weight on Earth ? Given: acceleration due to gravity on the Moon = 1.63 m/s^2 and acceleration due to gravity on the Earth = 9.8 m/s^2</p>	3
<p style="text-align: center;">SECTION D</p> <p style="text-align: center;">Q No 34 to 36 are Long answer questions</p>		
34	<p>(i) Explain the difference between Evaporation and Boiling by giving any two points of difference for each.</p> <p>(ii) How does the rate of evaporation change with the increased Humidity and increased Surface area?</p> <p>(iii) What is the physical state of water at:</p> <p>(a) 0°C</p> <p>(b) 100°C</p> <p style="text-align: center;">OR</p>	2+1+2=5
34	<p>(i) What type of clothes should we wear in the summer season and why?</p> <p>(ii) Give reasons for the following:</p> <p>(a) A desert cooler cools better on a hot dry day.</p> <p>(b) Liquids generally have lower density as compared to solids. But ice floats on water.</p> <p>(c) We see water droplets on the outer surface of a glass containing ice-cold water.</p>	2+3=5

35	<p>Draw a neat diagram of a plant cell. Identify and label the cell organelle that is:</p> <p>(a) full of cell sap (b) involved in membrane biogenesis (c) referred to as the kitchen of the cell.</p> <p style="text-align: center;">OR</p>	2+3
35	<p>(a) What is cell division? (b) Name the two types of cell division. (c) State three differences between the two types of cell division.</p>	1+1+3
36	<p>(a) State universal law of gravitation. (b) Suppose gravity on the earth suddenly becomes zero, then in which direction will the moon begin to move if no other celestial body affects it? (c) The mass of Earth is 6×10^{24} kg and that of the moon is 7.4×10^{22} kg. If the distance between the Earth and the Moon is 3.84×10^5 km, calculate the force exerted by Earth on the Moon. Given $G = 6.7 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$.</p> <p style="text-align: center;">OR</p>	5
36	<p>(a) What do you mean by free fall ? (b) Why will a sheet of paper fall slower than one that is crumpled into a ball ? (c) A stone is released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground (Take $g = 9.8 \text{ m/s}^2$)</p>	
<p style="text-align: center;">SECTION E</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>Various types of changes are happening around us every day. The interconversion of states is a physical change because no change in the chemical nature of the substance takes place.</p> <p>Both water and cooking oil are liquid but their chemical characteristics are different. They differ in odour and inflammability. We know that oil burns in air whereas water extinguishes fire. It is this chemical property of oil that makes it different from water.</p> <p>(a) Classify the following as physical or chemical changes: rusting of almirah, mixing of iron filings and sulphur powder</p> <p>(b) How are physical and chemical changes different from each other?</p> <p>(c) Iron filings and sulphur were mixed together and divided into two parts 'A' and 'S'. Part 'A' was heated strongly while Part 'S' was not heated. Dilute hydrochloric acid was added to both the parts and evolution of gas was seen in both the cases.</p> <p>(i) Identify the gases released in both parts .</p>	(1+1+2)

	<p>(ii) How will you identify the two gases released?</p> <p>OR</p> <p>(c) Two chemical species X and Y combine to form a product P which contains both X and Y.</p> $X + Y \longrightarrow P$ <p>X and Y cannot be broken down into simpler substances by simple chemical reactions. From the given information, classify P as an element or a compound. Will the properties of P differ from that of X and Y or not? Give a reason.</p>	
38	<p>Observe the diagram given below carefully and answer the questions that follow-</p>  <p>(a) Identify X in the given diagram. (b) Name the kidney-shaped cells (marked Y) that surround X. (c) State two functions of X.</p> <p>OR</p> <p>(c) Write two characteristic features of epidermis, the outermost layer of cells that contain X.</p>	(1+1+2)
39	<p>The first law of motion was based on the experimental observations of Galileo who observed that a smooth marble ball would move with constant speed on a frictionless surface along straight lines unless an external unbalanced force acts on it. No net force is needed to sustain the uniform motion of a marble. In practical situations it is difficult to achieve zero unbalanced force.</p>	(1+1+2)



Based on the above observation, answer the following questions:

- What will happen to the marble ball rolling on the right side plane (which is ultimately made horizontal), if the net unbalanced forces on it are not zero?
- Why is the first law of motion also known as the law of inertia?
- Which of the following has more inertia?-a five rupee coin or a one rupee coin? Give reason,why?

OR

(c) An object experiences a zero force. Is it possible for the object to be travelling with a non-zero velocity? If yes, state the conditions that must be placed on the magnitude and direction of the velocity.