

VIKAS BHARATI PUBLIC SCHOOL
SAMPLE PAPER (SESSION 2024-25)
CLASS IX
SUBJECT: SCIENCE

Time: 3 hrs

M.M.:80

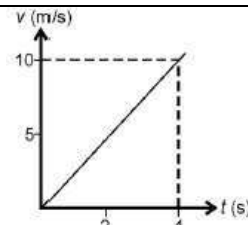
General Instructions:

- i. This question paper consists of 39 questions in 5 sections covered in 6 pages.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. 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.
- v. 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.
- vi. 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.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

	<u>SECTION A</u> Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.	
1.	Which of the following is a characteristic of matter? (i) Matter is made up of extremely small particles (ii) There is no space between particles of matter (iii) The particles of matter are continuously moving (iv) The particles of matter attract each other. (a) i) and ii) (b) only ii) (c) i), iii) and iv) (d) iii) and iv)	1
2.	Which of the following is the correct order of forces of attraction? (a) Water > Air > Sand (b) Air > Sugar > Oil (c) Air < Water < Sugar (d) Salt > Air > Juice	1
3.	The molecular mass of Na ₂ CO ₃ is: (Na=23 u, C=12 u, O=16 u) (a) 106 u (b) 53 u (c) 212 u (d) 160 u	1
4.	Which of the following statements is not true? (a) Heterogeneous mixtures can have variable composition (b) Homogeneous mixtures have a fixed composition (c) Milk is a heterogeneous mixture. (d) Salt solution is heterogeneous mixture.	1

5.	During summer, water kept in an earthen pot becomes cool because of the phenomenon of (a) diffusion (b) transpiration (c) osmosis (d) evaporation	1
6.	Two elements A and B combine to form the compound AB ₂ , which of the following statement is not true? (a) A and B will retain their chemical properties in AB ₂ (b) A and B will be present in a definite proportion in the compound. (c) AB ₂ is a pure substance. (d) All of these	1
7.	Oxygen molecule is (a) Monoatomic (b) Diatomic (c) Triatomic (d) Polyatomic	1
8.	Engulfing of food materials or foreign bodies by cells like Amoeba is called (a) diffusion (b) endocytosis (c) osmosis (d) plasmolysis	1
9.	Rough endoplasmic reticulum helps in the synthesis of (a) glycogen (b) starch (c) steroids (d) proteins	1
10.	The cell organelles with digestive enzymes are (a) ribosomes (b) food vacuoles (c) lysosomes (d) Golgi apparatus	1
11.	The mechanical strength and rigidity of cell wall is due to (a) cellulose (b) lignin (c) suberin (d) cutin	1
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13.	What does the area under the curve of a v-t graph represent? (a) Displacement (b) Acceleration (c) Uniform velocity (d) Retardation	1
14.	The v – t graph of a body of 10 kg moving with the help of a force is shown. Then the force involved is (a) 25 N (b) 15 N (c) 12.5 N (d) 62.5 N	1
15.	Acceleration due to gravity on the surface of the earth is the least (a) at poles (b) at equator (c) uniform at all places (d) none of the above	1
16.	How many electrons, protons and neutrons will be present in X^- , if atomic number of X is 9 and mass number is 19? (a) E = 9, P = 9, N = 10 (b) E = 10, P = 9, N = 10 (c) E = 10, P = 10, N = 10 (d) E = 9, P = 10, N = 10	1
Question No. 17 to 20 consist of two statements – 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 A. b) Both A and R are true, and R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true		
17.	Assertion : Displacement of an object may be zero even if the distance covered by it is not zero. Reason : Displacement is the shortest distance between the initial and final position.	1
18.	Assertion : The flash of lightning is seen before the sound of thunder is heard. Reason : Speed of light is greater than speed of sound.	1
19.	Assertion : A solution of table salt in a glass of water is homogeneous. Reason : A solution having different composition throughout is homogeneous.	1
20.	Assertion: Isobars are identical in chemical properties. Reason: Isobars have same mass number.	1
SECTION B Question No. 21 to 26 are very short answer questions		
21.	Write any two differences between prokaryotic and eukaryotic cells.	2
22.	Write any two differences between plasma membrane and cell wall.	2
23.	(a) What is the function of the areolar connective tissue? (b) Which substance is present in the adipose tissues? How does it help?	2



	OR Identify the type of muscular tissues having the following characteristics: (a) long with pointed ends and uninucleate. (b) long cylindrical, unbranched and multi-nucleated.	
24.	Two masses M_1 and M_2 have a ratio of 1:4, but both are moving with the same speed of 20m/s. Compute the ratio of their momenta (plural of momentum).	2
25.	A sound wave travels at a speed of 340 m/s. If the wavelength is 85 cm, what is the frequency of the wave? OR a) What is audible range of the average human ear? (b) Explain how ultrasound is used to clean spiral tubes and electronic components?	2
26.	Give the names of the following: (i) Tissue concerned with the conduction of food materials. (ii) Tissue capable of cell division.	2
	<u>SECTION C</u> Question No. 27 to 33 are short answer questions	
27.	Write the Electronic Configuration of Sodium and Chlorine, draw their atomic structure and write their valency?	3
28.	(a) Write the formulae of: i) Calcium chloride ii) Potassium carbonate OR (a) Calculate the formula unit mass of NH_4NO_3. [Atomic mass of N = 14 u, H = 1 u, O = 16 u] (b) (i) Define atomicity. (ii) State the Law of Conservation of mass.	3
29.	(a) Define weed. Give two examples. (b) Why is it essential to remove weeds from agricultural fields?	3
30.	Mention the three preventive and control measures used before storage of grains.	3
31.	(a) A car travels with a velocity of 10 ms^{-1} and accelerates at 5 ms^{-2}. Calculate the final velocity when it has travelled 30 m. (b) Define uniform motion.	3
32.	(a) A force of 20 N changes the position of a body. If mass of the body is 2 kg, find the acceleration produced in the body. (b) When a carpet is beaten with a stick dust comes out of it. Explain.	3
33.	A force of 100 N acts on a surface of area 25 cm^2 . Calculate the pressure exerted. Calculate the changed pressure if the force now is reduced to 25 N.	3
	<u>SECTION D</u> Question No. 34 to 36 are long answer questions.	

34.	(a) Two bodies of equal masses move with uniform velocities v and $3v$ respectively. Find the ratio of their kinetic energies. (b) Sarita lives on the third floor of a building at the height of 15 m. She carries her school bag weighing 5.2 kg from the ground floor to her house. Find the amount of work done by her and identify the force against which she has done work ($g = 10 \text{ ms}^{-2}$) OR (a) Justify that “a body at a greater height has larger energy”. (b) A body of mass 5 kg is thrown up at a velocity of 20 m/s. Find the kinetic energy of the body at the time of throw. Also, find the potential energy of the body at the highest point. The value of $g = 10 \text{ m/s}^2$.	5
35.	(a) Element X has an atomic number 12 and an atomic mass number 26. Draw a diagram showing the distribution of electrons in the orbits and the composition of the nucleus (neutrons and protons) of the neutral atom of the element. What is the valency of the element and why? (b) If this element X combines with another element Y whose electronic configuration is 2, 8, 7, what will be the formula of the compound thus formed? State how did you arrive at this formula. OR (a) What were the conclusions of Rutherford’s α-particle scattering experiment. (b) On the basis of Thomson’s model of an atom explain how the atom is neutral as a whole.	5
36.	(a) What do you mean by a meristematic tissue? (b) Mention different types of meristematic tissues present in plants. Draw a diagram showing the three types of meristematic tissues. OR Write two functions each of connective tissue and muscular tissue? Also draw the diagram of striated and non-striated muscle fibres.	5
	SECTION – E Question 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.	
37.	Sound bounces off a solid or a liquid like a rubber ball bounce off a wall. Like the light, sound gets reflected at the surface of a solid or liquid and follows the same laws of reflection. The directions in which the sound is incident and is reflected make equal angles with the normal to the reflecting surface at the point of incidence, and the three are in the same plane. If we clap near a suitable reflecting object such as a tall building or a mountain, we will hear the same sound again a little later. This sound that we hear is called an echo. The sensation of sound persists in our brain for about 0.1 s. To hear a distinct echo the time interval between the original sound and the reflected one must be at least 0.1s. Hence, for hearing distinct echoes, the minimum distance of the obstacle from the source of sound must be 17.2 m. This distance will change with the temperature of air. Another phenomenon of reflection of sound is reverberation. A sound created in a big hall will persist by repeated reflection from the walls until it is reduced to a value where it is no longer audible. Excessive reverberation is highly undesirable. (a) What is the reciprocal of frequency called? (b) Can an echo be heard on a warmer day if the distance between the source and obstacle is kept same? Justify. OR (b) Why can’t sound travel in vacuum? (c) A person makes sound near an obstacle and hears the echo after 2 s. What is the distance of the obstacle from the person if the speed of the sound, v is taken as 344 m/s?	4

38.	(a) The knowledge of the valencies of various radicals helps us to write the formulae of chemical compounds. The total positive charge on positive ions (cations) is equal to the total negative charge on negative ions (anions) in a molecule. Therefore, in writing the formula of a compound, the positive and negative ions are adjusted in such a way that the total number of positive charges of positive ions (cations) becomes equal to the total number of negative charges of negative ions (anions). There is another simple method for writing the formulae of ionic compounds. In this method, the valencies (or positive or negative charges) of the ions can be 'crossed over' to give subscripts. The purpose of crossing over of charges is to find the number of ions required to equalise the number of positive and negative charges. (a) Write any two triatomic molecules. OR (a) Write the names of the following compounds: (i) $(\text{NH}_4)_2\text{SO}_4$ (ii) $\text{Al}(\text{OH})_3$ (b) (i) The oxide of potassium has a chemical formula K_2O. State the valency of K. (ii) What is the formula of Ammonium nitrate? (c) Write the formulae and names of the compounds formed by combination of (i) Fe^{3+} and SO_4^{2-} (ii) NH_4^+ and CO_3^{2-}	4
39.	Plasma membrane or Cell membrane is the outermost covering of the cell that separates the contents of the cell from its external environment. The flexibility of the cell membrane also enables the cell to engulf in food and other material from its external environment. Such processes are known as endocytosis. Water obeys the law of diffusion. The movement of water molecules through such a selectively permeable membrane is called osmosis. The movement of water across the plasma membrane is also affected by the amount of substance dissolved in water. (a) What is the plasma membrane made up of? (b) Name the movement of a substance from the region of higher concentration to the region where its concentration is lower is low. (c) Why cell membrane is known as selectively permeable membrane? OR (c) State two differences between cell membrane and cell wall.	4