Vikas Bharati Public School
Sample Paper (Session - 2025-26)
Class IX
Subject: Science

Time: 3 hrs **M.M.:80**

General Instructions:

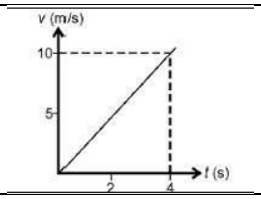
(i) This question paper consists of 6 printed pages having 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

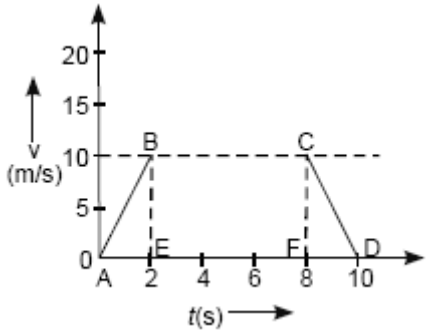
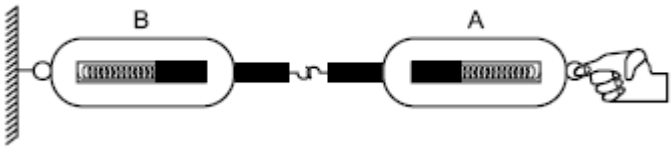
(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

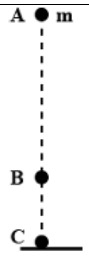
Q.No	SECTION A	Marks
1.	Which organelle is known as the "Energy Currency" generator of the cell? (a) Golgi apparatus (b) Mitochondria (c) Lysosomes (d) Endoplasmic Reticulum	**1**
2.	A defining feature of a eukaryotic cell compared to a prokaryotic one is: (a) Presence of ribosomes (b) Large size (c) Membrane-bound nucleus (d) Absence of cell wall	**1**
3.	If a cell is placed in a hypertonic solution, the cell will: (a) Swell up (b) Shrink (c) Remain the same (d) Burst	**1**
4.	Which tissue provides mechanical strength and is composed of dead, lignified cells? (a) Parenchyma (b) Collenchyma (c) Sclerenchyma (d) Xylem	**1**
5.	Which connective tissue joins a skeletal muscle to a bone? (a) Ligament (b) Cartilage (c) Tendon (d) Areolar tissue	**1**
6.	The movement of water and minerals in plants is the primary function of: (a) Phloem (b) Xylem (c) Stomata (d) Epidermis	**1**
7.	In bee-keeping, the quality or taste of honey is determined by: (a) Bee variety (b) Pasturage (c) Hive size (d) Collection method	**1**
	Question No. 8 to 9 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**	
8.	**Assertion (A):** Lysosomes are called "suicide bags" of the cell. **Reason (R):** They contain digestive enzymes that can destroy their own cell during damage.	**1**
9.	**Assertion (A):** Striated muscles are also known as skeletal muscles. **Reason (R):** They are mostly attached to bones and help in body movement.	**1**

10.	Identify the tissue (a) that stores fat in our body and acts as an insulator. (b) helps to transfer wastes and dissolved gases	**2**
11.	Distinguish between Mixed Cropping and Crop Rotation. **OR** List four factors for which crop variety improvement is done.	**2**
12.	(a) What are the two types of feed requirements for cattle? (b) Name any two Indian local breeds of cows.	**3**
13.	(a) Write any two differences between mitosis and meiosis. (b) Who discovered the nucleus of a cell?	**3**
14.	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. **Read the given passage carefully and answer the following questions:** (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) How is a prokaryotic cell differentfrom a eukaryotic cell. (2 points) **OR** (c) State two differences between cell membrane and cell wall.	**4**
15.	**Attempt Part A or B** **A**. List three functions of epidermis. What changes take place in epidermis as the plant grows older? **B**. Establish the relationship between structure, function and location in each case: (a) Bone (b) Areolar tissue (c) Sclerenchyma (d) Collenchyma (e) Ciliated columnar epithelium	**5**
	SECTION B	
16.	A student smells a gas leak in the kitchen from another room. This is due to: (a) Sublimation (b) Diffusion (c) Fusion (d) Vaporization	**1**
17.	Which state of water possesses the highest kinetic energy? (a) Ice at 0°C (b) Water at 0°C (c) Water at 100°C (d) Steam at 100°C	**1**
18.	Two substances, A and B were made to react to form a third substance, A_2B according to the following reaction $2A + B \rightarrow A_2B$ Which of the following statements concerning this reaction are incorrect? (i) The product A_2B shows the properties of substances A and B. (ii) The product will always have a fixed composition. (iii) The product so formed cannot be classified as a compound. (iv) The product so formed is an element.	**1**

	(a) (i), (ii) and (iii) (b) (ii), (iii) and (iv) (c) (i), (iii) and (iv) (d) (ii), (iii) and (iv)	
19.	Calculate the molecular mass of Calcium Carbonate ($CaCO_3$). (Ca=40, C=12, O=16). (a) 56 u (b) 100 u (c) 84 u (d) 44 u	**1**
20.	An element 'A' has a valency of 1 and 'B' has a valency of 2. The formula is: (a) AB (b) A_2B (c) AB_2 (d) A_2B_2	**1**
21.	Write the chemical formula for Aluminum Hydroxide. (a) AlOH (b) $Al(OH)_3$ (c) Al_3OH (d) $Al(OH)_2$	**1**
22.	Which subatomic particle has a positive charge and is found in the nucleus? (a) Electron (b) Proton (c) Neutron (d) Alpha particle	**1**
	Question No. 23 consists 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**	
23.	**Assertion :** A solution of table salt in a glass of water is homogeneous. **Reason :** A solution having different composition throughout is homogeneous.	**1**
24.	A solution of alcohol in water has been prepared by mixing 150 ml of alcohol with 600 ml of water. Calculate the volume by volume percentage of the solution.	**2**
25.	a) A student was given a mixture of iron filing and sulphur? He was told to heat it and observe the compound. (i) What is colour of the compound formed? (ii) Write the effect of magnet on it. (iii) Write the action of carbon disulphide on it.	**3**
26.	Define Latent Heat of Vaporization. Explain why steam causes more severe burns than boiling water. **OR** (a) You can smell the fragrance of an unlit incense stick only by going close to it, but the smell of a lit incense stick reaches you several meters away. Why? (b) Define 'Diffusion' based on this observation. (c) What happens to the rate of diffusion in air if the temperature is higher on a particular day?	**3**

27.	A molecule is in general a group of two or more atoms that are chemically bonded together, that is, tightly held together by attractive forces. A molecule can be defined as the smallest particle of an element or a compound that is capable of independent existence and shows all the properties of that substance. Atoms of the same element or of different elements can join together to form molecules. **Read the given passage carefully and answer the following questions:** a) Calculate the atomicity of the following: i) KMnO4 ii) He b) Give the names of the elements present in the following compounds: i) Quick lime ii) Hydrogen bromide c) Write the cations and anions present in the following compounds i) NaCl ii) $CaCO_3$ **OR** c) An element 'X' forms an oxide with formula X_2O (i) State the valency of X. (ii) Write the formula of (a) chloride of X, (b) sulphate of X	**4**
28.	**Attempt Part A or B** **A.** (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. **B**. (a) Calculate the average atomic mass of chlorine if it exists commonly in two isotopes: $_{17}{}^{35}Cl$ (75%) and $_{17}{}^{37}Cl$ (25%). (b) On the basis of Thomson's model of an atom explain how the atom is neutral as a whole.	**5**
	SECTION C	
29.	What does the area under the curve of a v-t graph represent? (a) Displacement (b) Acceleration (c) Uniform velocity (d) Retardation	**1**
30.	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**
	Question No. 31 consists 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**	
31.	**Assertion :** Weight of a body on earth is equal to the force with which the body is attracted towards the earth. **Reason :** Weight of a body is independent of the mass of the body.	**1**
32.	If the distance between two masses be increased by a factor of 6, by what factor would the mass of one of them hence to be altered to maintain the same gravitational force?	**2**
33.	Give reasons for the following: (a) It is easy to walk on snow with flat shoes, than with high heel shoes. (b) Railway tracks are laid on large-sized wooden sleepers.	**2**

34.	**Attempt Part A or B** **A.** Calculate the work done to increase the velocity of a 1000 kg car from 10 m/s to 20 m/s. **B**. Derive the expression for the Kinetic Energy of an object.	**2**
35.	Find the displacement of a body whose velocity time graph is shown below :  	**3**
36.	(a) The sound of an explosion on the surface of lake is heard by a boatman 100 m away and a diver 100 m below the point of explosion. Of the two persons mentioned (boatman or diver) who would hear the sound first? Why? (b) Calculate the wavelength of a sound wave whose frequency is 220 Hz and speed is 440m/s in a given medium.	**3**
37.	 Look at the diagram above and answer the following questions: (a) When a force is applied through the free end of the spring balance A, the reading on the spring balance A is 15 g wt. What will be the reading of spring balance B? (b) Write reasons for your answer. (c) Name the force which balance A exerts on balance B and the force of balance B on balance A.	**3**
38.	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. The repeated reflection that results in this persistence of sound is called reverberation. Excessive reverberation is highly undesirable **Read the given passage carefully and answer the following questions:** (a) What is the reciprocal of frequency called? (b) What is the basic difference between echo and reverberation? ***<u>Attempt either subpart (c) or (d).</u>***	**4**

	(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? (c) Write any two applications of ultreasound.	
39.	***Attempt either option A or B.*** **A.** An object of mass 'm' is allowed to fall freely from point A as shown in the figure. Calculate the total mechanical energy of the object at: Point A Point B Point C State the law which is verified by your calculations  **B.** a) Give two examples each of : i) Work done is negative ii) Work done is Zero b) Define Power. Calculate the power of a pump which lifts 100 kg of water to a water tank placed at a height of 20 m in 10s. (Given g = 10 ms^{-2})	**5**