

# **Maharashtra State Board**

## **Class IX Science and Technology**

### **Sample Paper – 2**

**Time: 3 hrs**

**Max. Marks: 80**

**Note:**

1. Use the same answer-sheet for Section A and Section B.
2. Draw well-labelled diagrams wherever necessary.
3. All questions are compulsory.
4. Students should write the answers of questions in sequence.

#### **SECTION A**

**1.**

**(A)**

(a) **Rewrite the following statements with suitable words in the blanks:** **[3]**

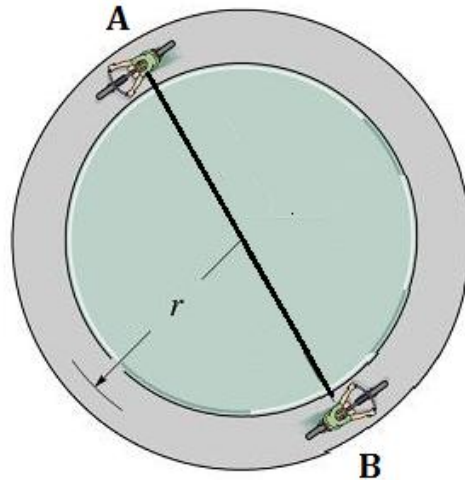
- i. When you compress a spring, the potential energy of the spring .....
- ii. The mass number of potassium and argon is 40; hence, they are known as .....
- iii. The slope of a distance–time graph indicates ..... of a moving body.

(b) **State whether the following statements are True or False:** **[2]**

- i. The gravitational force of the Earth causes the rain to fall from the sky to the Earth.
- ii. A food web consists of more than one organism at a given tropic level.

**(B) Rewrite the following statements by selecting the correct options:[5]**

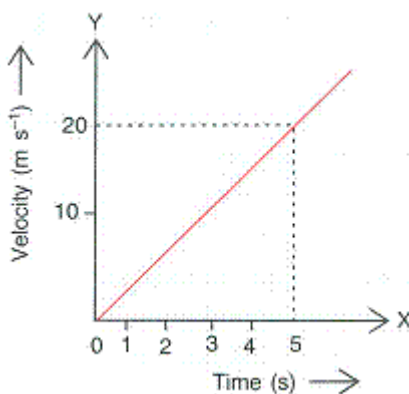
- i. If you whirl a stone on the end of the string and the string suddenly breaks, the stone will
  - (a) Fly directly towards you.
  - (b) Spiral in towards your hand.
  - (c) Spiral away from your hand.
  - (d) Fly off along the tangent to its circular path.
- ii. A cyclist is cycling along a circular track of radius R starting from point A. What will be the distance travelled and displacement of the cyclist when he completes half of the track and reaches point B?



- (a)  $0, 2r$   
 (b)  $\pi r, 2r$   
 (c)  $\pi r, r$   
 (d)  $2\pi r, 2r$
- iii. When we put some crystals of potassium permanganate in a beaker containing water, we observe that after some time, the water turns pink. This is due to  
 (a) Brownian motion  
 (b) Melting  
 (c) Sublimation  
 (d) Diffusion
- iv. To change a feeble sound to a loud sound, its ..... has to be increased.  
 (a) wavelength  
 (b) frequency  
 (c) speed  
 (d) amplitude
- v. In a food chain consisting of grass, caterpillar, frog and snake; if all the frogs die because of poisoning,  
 (a) All the caterpillars will die.  
 (b) All the snakes will die.  
 (c) The snakes will start feeding on caterpillars.  
 (d) The food chain will continue normally.

**2. Answer any five of the following:****[10]**

- Differentiate between autotrophs and heterotrophs.
- The velocity–time graph of a particle of mass 200 g moving along a straight line is shown in the figure. Calculate the force acting on the particle.



- What are the SI and CGS units of work? How are they related? Establish the relationship.
- A cork floats in water, while the iron nail sinks. Give reason.
- Calculate the moles of  $2.4 \times 10^{24}$  atoms of iron.
- Distinguish between colloid and suspension.

**3. Answer any five of the following:****[15]**

- Write a short note on Avogadro's number.
- A 40-W electric bulb is used for 15 days at 10 hertz per day. Find the units of energy consumed by the bulb and the cost of electricity at the rate of Rs 3 per unit.
- Write a short note on SONAR.
- What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem? Where will the magnification be maximum?
- Complete the following table:

Thrust (N)	Area (m <sup>2</sup> )	Pressure (N/m <sup>2</sup> )
-----	0.02	15000
2000	40	-----

- Give two examples of decomposers present in any ecosystem.
  - How is the presence of decomposers crucial in the ecosystem?

**4. Attempt any one of the following: [5]**

- i. An object starts linear motion with a velocity 'u', and under uniform acceleration 'a', it acquires a velocity 'v' in time 't'. Draw its velocity-time graph. From this graph, obtain the following equations:  
(a)  $v = u + at$   
(b)  $s = ut + \frac{1}{2} at^2$
- ii. What is a food chain? Explain with the help of a neat and well-labelled diagram.

**SECTION B**

**5.  
(A)**

- (a) **Find the odd one out: [2]**
- i. Sodium, Silver, Arsenic, Gold  
ii. Sieve tubes, Companion cells, Guard cells, Phloem parenchyma

- (b) **Match the following: [3]**

Column A	Column B
i. Apiculture	(a) Cattle
ii. Pisciculture	(b) Fish
iii. Sericulture	(c) Honey bees
	(d) Silkworms

**(B) Rewrite the following statements by selecting the correct options: [5]**

- i. The largest known cell is an ostrich egg which is 18 cm in diameter, while the  
(a) Smallest cell is a bacterial cell of about 0.01  $\mu\text{m}$  in diameter  
(b) Smallest cell is that of *Mycoplasma gallisepticum* which is about 0.01  $\mu\text{m}$  in diameter  
(c) Smallest cell is a bacterial cell of about 0.1  $\mu\text{m}$  in diameter  
(d) Smallest cell is that of *Mycoplasma gallisepticum* which is about 0.1  $\mu\text{m}$  in diameter
- ii. Skeletal muscles are attached to the bone and help in body movement. These cells are  
(a) Voluntary, and show the presence of alternating light and dark striations under the microscope  
(b) Involuntary, and show the presence of alternating light and dark striations under the microscope  
(c) Voluntary, and do not show the presence of alternating light and dark striations under the microscope  
(d) Involuntary, and do not show the presence of alternating light and dark striations under the microscope

- iii. Poultry farming involves the rearing of fowl for meat and eggs. The different types of fowls include
  - (a) Layers for meat and boilers for laying eggs
  - (b) Layers for laying eggs and boilers for meat
  - (c) Killari for laying eggs and Dangi for meat
  - (d) Killari for meat and Dangi for laying eggs
- iv. On 26<sup>th</sup> July 2005, Mumbai suffered heavy floods. The main cause for this was
  - (a) Lack of proper drainage system
  - (b) Improper disposal of liquid waste in sewers
  - (c) Choked sewers because of solid waste such as plastic bags
  - (d) Continuous heavy rains for more than 1 week
- v. Starch iodide + Chlorine gas  $\rightarrow$  Starch chloride + Iodine  $\downarrow$  is a..... reaction.
  - (a) combination
  - (b) displacement
  - (c) decomposition
  - (d) double displacement

**6. Answer any five of the following: [10]**

- i. Write the formula of sodium phosphate using the table of valencies.
- ii. State the hazards of e-waste.
- iii. What is fly ash? State its importance.
- iv. Why do we paint the outer side of the container of a solar cooker with black paint?
- v. What are the functions of lysosomes?
- vi. How is malaria spread? Name two diseases caused by protozoa.

**7. Answer any five of the following: [15]**

- i. The composition of nuclei of two atomic species X and Y are given below:

	X	Y
Protons	17	17
Neutrons	18	20

- (a) Find the mass number of X and Y. State the relationship between X and Y.
- (b) The K shell is completely filled and L shell of an atom is half filled. Find the number of electrons present in it. State the name of this element.
- ii.
  - (a) How are diseases classified on the basis of extent of occurrence?
  - (b) What are pandemic and sporadic diseases?
- iii. Discuss the structure of a neuron.
- iv. Write a short note on Phylum Arthropoda.
- v. Differentiate between plant and animal cell.
- vi. 'Humans are eukaryotic organisms'. Justify.

**8. Attempt any one of the following:**

**[5]**

- i. Explain with the help of a labelled diagram an activity for the verification of the law of conservation of mass.
- ii. Differentiate between chondrichthyes and osteichthyes.