

**Maharashtra State Board**  
**Class IX Science and Technology**  
**Sample Paper – 1**

**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. The shell-wise distribution of electrons is called the .....
  - ii. The combining capacity of an element is known as its .....
  - iii. The tendency of a body to resist acceleration is called .....

- (b) State whether the following statements are True or False: **[2]**
- i. Mass is a vector quantity.
  - ii. The kinetic energy of a body of mass  $m$  moving with a velocity  $v$  is  $\frac{1}{2} mv^2$ .

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

- i. The chemical formula of sodium phosphate is  
(a)  $Na_2PO_4$   
(b)  $NaPO_3$   
(c)  $Na_3PO_4$   
(d)  $Na_4PO_3$
- ii. The kinetic energy of a body of mass 2 kg moving with a velocity of 2 m/s is  
(a) 8 J  
(b) 4 J  
(c) 2 J  
(d) 16 J
- iii. The wave speed is  
(a) The number of waves produced per second  
(b) The product of the wave frequency and the wavelength  
(c) The product of the wave period and the wavelength  
(d) The product of the wave amplitude and the wavelength

- iv. If the volume of a solid body is reduced to half by cutting it, its density
  - (a) Becomes two times the initial density
  - (b) Becomes half the initial density
  - (c) Does not change
  - (d) Becomes four times the initial density
- v. Isotopes of an element have
  - (a) Different atomic numbers and different atomic mass numbers
  - (b) Different atomic numbers but same atomic mass numbers
  - (c) Same atomic numbers and same atomic mass numbers
  - (d) Same atomic numbers but different atomic mass numbers

2. Answer any five of the following:

[10]

- i. Define:
  - (a) Atomic number
  - (b) Atomic mass number
- ii. An object moving with an acceleration of  $4 \text{ m/s}^2$  is acted upon by a force of 20 N. Calculate the mass of the object.
- iii. Justify: 'The flow of energy in an ecosystem is unidirectional'.
- iv. Why we cannot hear the echo produced in our classroom?
- v. Calculate the number of moles in 69 grams of sodium.
- vi. Distinguish between pressure and buoyant force.

3. Answer any five of the following:

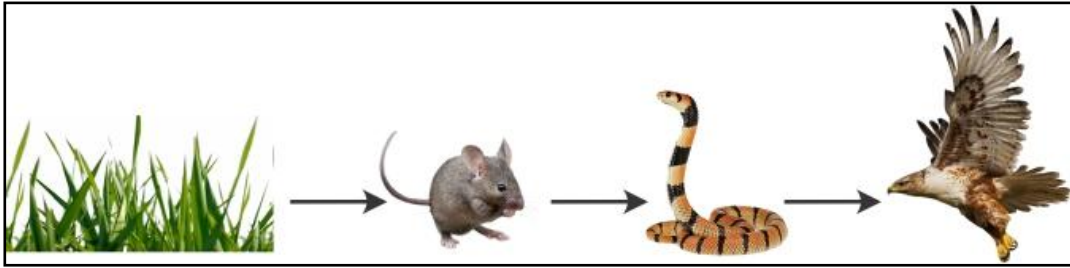
[15]

- i. What is kinetic energy? Can kinetic energy be negative? Why?
- ii. (a) Why is the constant of gravitation called a universal constant?  
(b) Why is Newton's law of gravitation called the universal law of gravitation?
- iii. The table below shows the number of electrons, protons and neutrons in the elements A, B and C. Using the data given below, identify:
  - (a) Noble gas
  - (b) Pair of isotopes

Element	Electrons	Neutrons	Protons
A	6	6	6
B	18	22	18
C	6	8	6

- iv. State the kinematical equations of motion in case of a body moving along a straight line with uniform acceleration.

v. Observe the given link and state the relation.



vi. Write the valencies of the following elements:

(a) Carbon

(b) Neon

(c) Aluminium

4. Attempt any one of the following:

[5]

- i. What were the observations of Rutherford's experiment of scattering of alpha particles?
- ii. (a) State the conditions under which a body floats or sinks in a liquid.  
(b) State Archimedes' principle.

**SECTION B**

5.

**(A)**

- (a) Find the odd one out: [2]
- i. Stainless steel, Silver, Bronze, Brass
  - ii. *Amoeba*, *Paramecium*, Earthworm, *Euglena*

- (b) Match the following: [3]

Column A	Column B
i. Pisces	(a) Turtle
ii. Reptilia	(b) Bat
iii. Mammalia	(c) Tuna
	(d) Toad

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

- i. During the conversion of ice into water, the heat .....
  - (a) Is taken in and the temperature increases
  - (b) Is taken in but the temperature does not increase
  - (c) Is given out and the temperature decreases
  - (a) Is given out but the temperature does not decrease
- ii. Instead of preparing the mount of onion peel, if we prepare the mount of inner cheek cells, we are not able to see the ..... of the cell.
  - (a) Nucleus
  - (b) Cytoplasm
  - (c) Cell membrane
  - (d) Cell wall
- iii. Which description suits best for striated muscle cells?
  - (a) Short, rounded, unbranched and multinucleated
  - (b) Long, rounded, unbranched and multinucleated
  - (c) Short, cylindrical, branched and uninucleated
  - (d) Long, cylindrical, unbranched and multinucleated
- iv. .... is not a special feature of class Pisces.
  - (a) Presence of scales
  - (b) Locomotion by fins
  - (c) Respiration by gills
  - (d) Cuticular exoskeleton
- v. What is the colour of the precipitate which gets formed in the experiment carried out for the verification of the law of conservation of mass?
  - (a) Green
  - (b) White
  - (c) Blue
  - (d) Yellow

6. Answer any five of the following: [10]
- i. State the scientific term for the following changes:
    - (a) Solid wax converts into liquid wax.
    - (b) Naphthalene balls disappear after few days.
  - ii. Give scientific reason: Air is a mixture.
  - iii. Generally, thin people feel colder than fat people. Why?
  - iv. Draw a neat labelled diagram of the internal structure of a mitochondrion.
  - v. Give two examples each:
    - (a) Hybrid varieties of rice
    - (b) Hybrid varieties of wheat
  - vi. Classify the following wastes into biodegradable and non-biodegradable wastes.  
Plant leaves, plastic, glass, animal dung

7. Answer any five of the following: [15]
- i. What is a compound? Write any two characteristics of a compound.
  - ii. Distinguish between plant cell and animal cell.
  - iii. Name the following tissues:
    - (a) Forms the inner lining of the mouth.
    - (b) Connects muscle to bones.
    - (c) Responsible for increase in length of plants.
  - iv. State the preventive measures for hepatitis.
  - v. What is mixed cropping? What are its advantages?
  - vi. Explain the three R's in solid waste management. Write its significance.

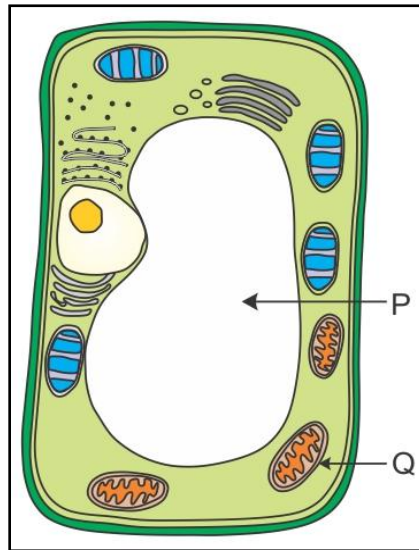
8. Attempt any one of the following:

[5]

(A) Answer the following questions based on separation technique:

- i. How would you separate a mixture of sand and iodine crystals into its components?
- ii. What is sublimation?
- iii. Name any two substances which sublime at room temperature.

(B) Observe the figure carefully and answer the questions based on it:



- i. Which type of cell is shown in the above figure—plant cell or animal cell?
- ii. Which organelle present in this type of cell performs the function of photosynthesis?
- iii. Identify P and Q.
- iv. State any one function each of P and Q.