

Maharashtra State Board

Class IX Science and Technology

Sample Paper – 3

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. If K and L shells of an atom are full, then the total number of electrons in an atom is _____.
 - ii. Waste which contains discarded computer parts is known as _____.
 - iii. Recoil of a gun is an example of Newton's _____ law of motion.
- (b) State whether the following statements are True or False: **[2]**
- i. In a distance–time graph, if the line is horizontal, then the object is speeding up.
 - ii. A sound of high pitch will be a sound with less loudness.

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

- i. Equal amount of tea is kept in the cup and saucer. The tea cools faster when placed in a saucer than in a cup. This phenomenon shows that the rate of evaporation depends on



- (a) Colour of utensil
 - (b) Humidity
 - (c) Temperature
 - (d) Surface area
- ii. A ball falls from a height h . After it falls through a distance, the sum of its kinetic and potential energy
 - (a) Is equal to the potential energy at h
 - (b) Is greater than the potential energy at h
 - (c) Is lesser than its potential energy at h
 - (d) None of the above

- iii. When you travel 40 km towards East and then 10 km towards West, your net displacement is
 - (a) 30 km towards East
 - (b) 30 km towards West
 - (c) 50 km towards East
 - (d) 50 km towards West

- iv. The same body is immersed in two liquids A and B in succession. The extent to which the body sinks in liquid B is less than in liquid A. What are the conclusions which can be derived from such an observation?
 - (a) The density of liquid B is more than liquid A.
 - (b) The density of liquid A is more than liquid B.
 - (c) No such conclusion can be made.
 - (d) The density of the solid is less than the liquid in both.

- v. Living organisms use the abiotic factors around them for
 - (a) Food and clothing to obtain energy and protection from biotic factors.
 - (b) Food and shelter to grow, survive and reproduce.
 - (c) Reproduction to ensure the survival of their species.
 - (d) Sanitation needs which help them become civilised and ensure their survival.

2. Answer any five of the following:

[10]

- i. 12 grams of carbon contains 1 mole of carbon atoms. What is the mass of one atom of carbon?
- ii. Find the force needed to produce acceleration of 2 m/s^2 in a body of 10 kg mass. If 30 N is applied on this body, how much acceleration will be produced?
- iii. State the characteristics of a colloid.
- iv. Distinguish between distance and displacement.
- v. List the different types of biomes and state its subtypes.
- vi.
 - (a) What do you mean by the term 'free fall'?
 - (b) During a free fall, will heavier objects accelerate more than the lighter ones?

3. Answer any five of the following:

[15]

- i.
 - (a) Define the terms 'frequency', 'wavelength' and 'velocity' of a sound wave. What is the relation between them?
 - (b) A body vibrating with a time-period of $1/260 \text{ s}$ produces a sound wave which travels in air with a velocity of 350 m/s. Calculate the wavelength.

- ii. A box of mass 10 kg and dimensions $3 \text{ m} \times 3 \text{ m} \times 3 \text{ m}$ is kept on the floor. Each of its sides is reduced by half metre and its mass reduces to 7 kg. Find

the ratio of the pressure exerted on the floor before and after the reduction ($g = 10 \text{ m/s}^2$).

- iii. Construct a food web consisting of the given organisms:
Grass, Mouse, Snake, Rabbit, Grasshopper, Lizard, Hawk
- iv. State and explain the Universal Law of Gravitation.
- v. How does nature maintain the balance of nutrients which flow through the ecosystem?
- vi. How would you separate a mixture of sand and iodine crystals into its components?

- 4.** Attempt any one of the following: **[5]**
- i. Prove the law of conservation of linear momentum in case of collision of two balls.
 - ii. What is a pyramid of energy? Draw a diagram for the same.

SECTION B

5.

(A)

- (a) Find the odd one out: [2]
- Carbon dioxide, Hydrogen, Hydrogen peroxide, Water vapour
 - Connective tissue, tendons, blood, glandular epithelium

- (b) Match the following: [3]

Scientist	Contribution to the study of cells
i. Robert Brown	(a) Named the fluid content of a cell as protoplasm
ii. Johannes Purkinje	(b) Observed bacteria for the first time
iii. Zacharias Jansen	(c) Demonstrated the presence of a nucleus in a cell
	(d) Discovered the first microscope

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

- Based on location, simple squamous epithelium differs from stratified squamous epithelium as
 - simple squamous epithelium is found in the interior of the liver, while stratified squamous epithelium is found in the outer layer of the skin
 - simple squamous epithelium is found in the lining of the mouth, while stratified squamous epithelium is found in the interior of the liver
 - simple squamous epithelium is found in the lung alveoli, while stratified squamous epithelium is found in the outer layer of the skin
 - simple squamous epithelium is found in the pancreas, while stratified squamous epithelium is found in the lining of the trachea
- Organisms of Kingdom Monera are characterised by
 - Unicellular, prokaryotic cells with a distinct nucleus and cytoplasm
 - Unicellular, prokaryotic cells without a distinct nucleus and cytoplasm
 - Multicellular, prokaryotic cells with a distinct nucleus and cytoplasm
 - Multicellular, eukaryotic cells with a distinct nucleus and cytoplasm
- A diseased state is associated with the
 - Departure from the mental state without signs and symptoms
 - Departure from the normal state either physically or physiologically along with random signs and symptoms
 - Departure from the normal state either physically or physiologically along with signs and symptoms specific to the disease
 - Departure from the normal state physically accompanied by signs and symptoms specific to the causative organism

- iv. Nutrients are important for the growth of plants. The nutrients which plants take up from the surrounding are broadly classified into macro and micro nutrients. The micro nutrients include
- (a) iron, nitrogen, molybdenum, rhodium, chlorine, sulphur, manganese
 - (b) iron, zinc, boron, molybdenum, copper, chlorine, manganese
 - (c) boron, copper, magnesium, molybdenum, chlorine, iron, zinc
 - (d) sulphur, carbon, nitrogen, calcium, hydrogen, oxygen, phosphorus, magnesium, potassium
- v. The components of a mixture of sand and common salt are separated by
- (a) Sublimation
 - (b) Evaporation
 - (c) Filtration
 - (d) Centrifugation

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

- i. Why do cricketers playing a test match wear white clothes?
- ii. Describe the feed provided to cattle for better growth and improved milk production.
- iii. What is vermicompost?
- iv. State the postulates of the modern cell theory.
- v. Write the formula of ammonium sulphate using the table of valencies.
- vi. Write a note on ligament.

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

- i. Describe Thomson's model of an atom with the help of a labelled diagram.
- ii. Describe the permanent tissue found in plants.
- iii. Draw the structure of AIDS virus.
- iv. Give the characteristic features of the organisms classified under Phylum Nematoda.
- v. State the effects of improper solid waste management.
- vi. List the nutrients supplied by air, water and soil to plants.

8. Attempt any one of the following: [5]

- i. Draw a well-labelled diagram of an animal cell and label the organelle which
 - (a) Contains powerful digestive enzymes
 - (b) Has its own DNA
 - (c) Forms a cytoplasmic framework
 - (d) Helps in expelling excess water in amoeba
- ii. Explain Rutherford's Scattering Experiment and its atomic model with the help of a neat labelled diagram.