

# SCIENCE EXPLORATION

## Sample Question Paper 6

Class IX | 2026-27

**Time Allowed: 3 hours**

**Maximum Marks: 80**

### General Instructions

1. This paper contains 39 questions in three sections: A Biology, B Chemistry and C Physics. All questions are compulsory.
2. Each section has three internal choices. Attempt only one alternative wherever OR is given.
3. Marks are shown on the right. Show calculations and draw neat labelled diagrams where required.
4. Answer activity questions on paper; you do not need to perform the experiments. Use  $g = 10 \text{ m s}^{-2}$  unless otherwise stated.

### SECTION A

(Biology | Questions 1–16 | 30 marks)

1. What causes blood to clot? [1]
2. Identify the scientific term: a membrane sac containing digestive enzymes? [1]  
(i) Central vacuole (ii) Mitosis  
(iii) Osmosis (iv) Lysosome
3. Identify the scientific term: a small non-membranous particle occurring free or attached to membranes? [1]  
(i) Lysosome (ii) Ribosome  
(iii) Chloroplast (iv) Leucoplast
4. Identify the scientific term: plants with true roots, stems, leaves and vascular tissue but no seeds? [1]  
(i) Gymnosperms (ii) Thallophytes  
(iii) Pteridophytes (iv) Angiosperms
5. Identify the scientific term: a large fluid-filled sac occupying much of a mature plant cell? [1]  
(i) Central vacuole (ii) Cell membrane  
(iii) Nucleus (iv) Lysosome
6. Identify the scientific term: a thin boundary controlling exchange between the cell and its surroundings? [1]  
(i) Central vacuole (ii) Eukaryotic cell  
(iii) Cell membrane (iv) Leucoplast

7. Identify the scientific term: a rigid external covering outside a plant cell's membrane? [1]

- (i) Cell wall
- (ii) Diffusion
- (iii) Ribosome
- (iv) Prokaryotic cell

8. Identify the scientific term: a complex tissue containing vessels, tracheids, fibres and parenchyma? [1]

- (i) Xylem
- (ii) Apical meristem
- (iii) Epidermis
- (iv) Cardiac muscle

9. Meristematic tissues divide repeatedly. What property of their cells allows them to do this? [1]

- (i) They have thick walls for protection.
- (ii) They contain large vacuoles that store nutrients.
- (iii) They have thin walls, dense cytoplasm and large prominent nucleus.
- (iv) They are functionally differentiated cells.

10. A. If all flowers in a type of plant were only capable of self-pollination, how would it affect the genetic diversity over several generations? Explain. [2]

**OR**

B. State one defining feature of each of the following: Style and Ovule.

11. The Figure shows phloem tissue. [2]



- (a) What is the principal material transported by phloem?
- (b) Why is it a complex rather than a simple tissue?

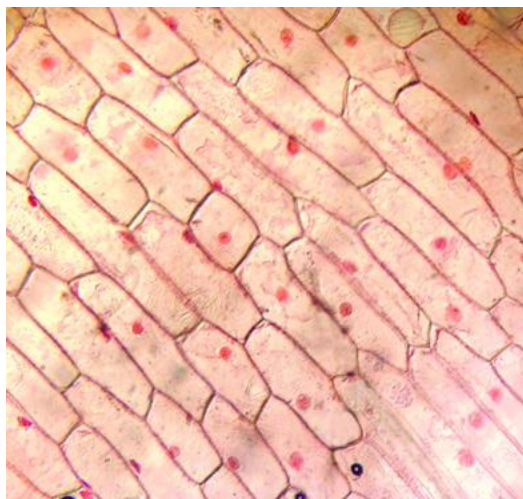
12. A. State one defining feature of each of the following: Areolar tissue and Intercalary meristem. [2]

**OR**

B. State one defining feature of each of the following: Adipose tissue and Neuron.

13. The Figure shows an onion epidermal preparation.

[3]



- (a) Which structure gives the cells their distinct regular outlines?
- (b) Name the boundary immediately inside the cell wall.
- (c) Why is an onion peel suitable for a classroom slide?

14. A. Viruses contain genetic material like living organisms but lack cellular organisation. Which features prevent them from fitting into the five kingdom system? What does this tell us about the limitations of classification systems? [3]

**OR**

B. Write a short scientific note on Mammalia and Animalia. Give one defining feature of each, then describe the role or significance of each.

15. Two entries on a science display have lost their headings.

A: Marine animals with spiny skin and a water vascular system.

B: A naming system using a genus name and a specific epithet.

Identify both entries. For each, state its role and link it to a relevant feature. [4]

16. Answer the following about Sepal and Uterus:

- (a) State one defining feature and one role of Sepal.
- (b) State one defining feature and one role of Uterus.
- (c) Give one application or example illustrating the significance of Sepal. [5]

## **SECTION B**

(Chemistry | Questions 17–29 | 25 marks)

17. What kind of ion will oxygen (O) form? [1]

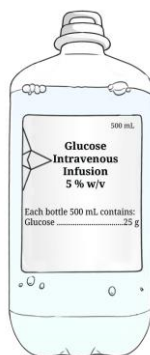
18. Which of the following balances cations in ionic compounds? [1]

- |                          |                                  |
|--------------------------|----------------------------------|
| (i) Relative atomic mass | (ii) Law of conservation of mass |
| (iii) Anion              | (iv) Formula unit mass           |

19. Identify the scientific term: an atomic model allowing electrons in particular stationary energy levels? [1]  
(i) Bohr model (ii) Electronic configuration  
(iii) K shell (iv) Isobars
20. Which of the following holds ions together in ionic substances? [1]  
(i) Molecular mass (ii) Formula unit mass  
(iii) Ionic bond (iv) Molecule
21. Which of the following holds atoms together in many molecules? [1]  
(i) Cation (ii) Law of constant proportions  
(iii) Covalent bond (iv) Molecular mass
22. Which of the following represents many elemental and compound substances? [1]  
(i) Molecule (ii) Chemical formula  
(iii) Element (iv) Cation
23. Identify the scientific term: a positively charged projectile used in the gold-foil experiment? [1]  
(i) Valency (ii) Electronic configuration  
(iii) Mass number (iv) Alpha particle
24. Identify the scientific term: the tiny central region containing protons and neutrons? [1]  
(i) Bohr model (ii) Atomic number  
(iii) Nucleus of an atom (iv) Isobars
25. A. At a Tiwari Academy science workshop, students discuss the following task. State one defining feature of each of the following: Filtration and Suspension. [2]
- OR**
- B. Will there be any change in the size of common salt crystals if the rate of evaporation is increased or decreased? Explain.
26. Write a short scientific note on Chromatography and Saturated solution. Give one defining feature of each, then describe the role or significance of each. [3]
27. A student changes  $\text{H}_2\text{O}$  to  $\text{H}_2\text{O}_2$  when trying to balance a water-formation equation. Explain the error and the correct type of change. State the law governing the total mass in this reaction. [3]

28. A. The Figure shows a 500 mL glucose solution labelled 5% w/v.

[4]



- (a) What does the label mean?
- (b) Calculate the glucose mass in the full 500 mL.
- (c) Name the solute.
- (d) Does w/v compare two masses or mass with volume?

**OR**

B. Two entries on a science display have lost their headings.

A: Direct change of a solid into vapour followed by deposition on cooling.

B: Passing a mixture through a porous barrier that retains insoluble particles.

Identify both entries. For each, state its role and link it to a relevant feature.

29. A. A neutral model atom in a particle-counting task contains 3 protons and 4 neutrons. Determine its atomic number and mass number. How many electrons does it contain? If it loses one electron, what is its charge? Would adding one neutron change its element? Explain.

[5]

**OR**

B. Answer the following about Mass number and Proton:

- (a) State one defining feature and one role of Mass number.
- (b) State one defining feature and one role of Proton.
- (c) Give one application or example illustrating the significance of Mass number.

### **SECTION C**

(Physics | Questions 30–39 | 25 marks)

30. Identify the scientific term: work done when force has a component opposite displacement?

[1]

- |                         |              |
|-------------------------|--------------|
| (i) Negative work       | (ii) Fulcrum |
| (iii) Mechanical energy | (iv) Power   |

31. Identify the scientific term: energy due to motion?

[1]

- |                      |                    |
|----------------------|--------------------|
| (i) Work             | (ii) Positive work |
| (iii) Kinetic energy | (iv) Lever         |

32. Identify the scientific term: the rate of change of velocity? [1]

(i) Uniform motion

(ii) Acceleration

(iii) Velocity–time graph

(iv) Average speed

33. Why is a scientific theory different from an unsupported guess? Give two points. [2]

34. A. Describe how albedo affects the Earth's surface temperature and its climate. [2]

**OR**

B. State one defining feature of each of the following: Deforestation and Biosphere.

35. A ball of mass 2 kg is thrown up with a velocity of  $20 \text{ m s}^{-1}$ . (i) Identify the sign of the work done by gravity on the ball during its upward motion and its downward motion. (ii) If the ball reaches a height of 19.4 m, how much work was done by air resistance (assume  $g = 10 \text{ m s}^{-2}$ ). [3]

36. A. A winding road is shown in the Figure. [3]



(a) Would the length measured along the road generally equal the displacement between its ends?

(b) Which quantity is recorded by a vehicle's odometer?

(c) A vehicle travels 12 km along the road while its endpoints are 8 km apart. Find the distance-to-displacement-magnitude ratio.

**OR**

B. Write a short scientific note on Speed and Position–time graph. Give one defining feature of each, then describe the role or significance of each.

37. A. What would happen to plants and animals on Earth if the biogeochemical cycles were disrupted and stopped? Explain by giving a few examples. [3]

**OR**

B. Write a short scientific note on Lithosphere and Sea breeze. Give one defining feature of each, then describe the role or significance of each.

38. Observe the weightlifter holding a barbell.

**[4]**



- (a) Name the downward force on the barbell.
- (b) What must the lifter's upward force equal when the barbell is held steady?
- (c) If the barbell accelerates upward, which of these forces is larger?
- (d) For a 20 kg barbell accelerated upward at  $2 \text{ m s}^{-2}$ , find the resultant force.

39. Answer the following about Frequency and Wavelength:

- (a) State one defining feature and one role of Frequency.
- (b) State one defining feature and one role of Wavelength.
- (c) Give one application or example illustrating the significance of Frequency.

**[5]**