

SCIENCE EXPLORATION

Sample Question Paper 18

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. Which of the following supports growth, repair and many forms of asexual reproduction? **[1]**
(i) Chloroplast (ii) Chromoplast
(iii) Cell membrane (iv) Mitosis
2. Which of the following forms haploid cells for sexual reproduction? **[1]**
(i) Leucoplast (ii) Chromoplast
(iii) Golgi apparatus (iv) Meiosis
3. Identify the scientific term: a blood cell involved in defending the body? **[1]**
(i) Phloem (ii) White blood cell
(iii) Aerenchyma (iv) Xylem
4. Which process moves water through a selectively permeable membrane from a dilute solution towards a more concentrated solution? **[1]**
(i) Osmosis (ii) Plasmolysis
(iii) Cell membrane (iv) Chloroplast
5. Which term names the shrinkage of the cell contents away from the wall when a plant cell loses water in a hypertonic solution? **[1]**
(i) Osmosis (ii) Plasmolysis
(iii) Eukaryotic cell (iv) Chloroplast
6. Which of the following permits movement down a concentration gradient? **[1]**
(i) Diffusion (ii) Meiosis
(iii) Lysosome (iv) Cell membrane

7. Identify the pair that incorrectly matches the cell organelle with its function. [1]

- (i) Ribosome — Protein synthesis
- (ii) SER — Lipid and cellulose synthesis
- (iii) Lysosome — Digestion of foreign agents

8. Which entry is correctly associated with this feature: it has inner folds called cristae and contains its own DNA? [1]

- (i) Cell wall
- (ii) Golgi apparatus
- (iii) Mitochondrion
- (iv) Chromoplast

9. Which entry is correctly associated with this feature: it contains chlorophyll and its own DNA? [1]

- (i) Leucoplast
- (ii) Diffusion
- (iii) Chloroplast
- (iv) Smooth endoplasmic reticulum

10. A. How can changes in climate affect the biodiversity? [2]

OR

B. State one defining feature of each of the following: Cnidaria and Angiosperms.

11. A. State one defining feature of each of the following: Grafting and Spore formation. [2]

OR

B. State one defining feature of each of the following: Stigma and Menstruation.

12. State one defining feature of each of the following: Chlorenchyma and Guard cells. [2]

13. The Figure shows a pine cone. [3]



- (a) Name the plant group to which pine belongs.
- (b) Are its seeds enclosed in a fruit?
- (c) State one feature it shares with flowering plants.

14. How does the diversity of organisms contribute to the balance and stability of an ecosystem? [3]

15. Two entries on a science display have lost their headings.
A: Dividing tissue arranged along the sides of stems and roots.
B: Cells with very thick lignified walls, usually dead at maturity.
Identify both entries. For each, state its role and link it to a relevant feature. [4]

16. A. The Figure shows a longitudinal section of a flower. [5]



- (a) Name the male reproductive part.
- (b) Name the female reproductive part.
- (c) Where are ovules found?
- (d) What does a fertilised ovule develop into?
- (e) What does the ovary generally develop into after fertilisation?

OR

- B. Answer the following about Zygote and Filament:
- (a) State one defining feature and one role of Zygote.
 - (b) State one defining feature and one role of Filament.
 - (c) Give one application or example illustrating the significance of Zygote.

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which of the following purifies a dissolved solid? [1]

- | | |
|-------------------------|--------------|
| (i) Simple distillation | (ii) Solute |
| (iii) Crystallisation | (iv) Solvent |

18. Which of the following recovers a solvent or separates suitable liquids with sufficiently different boiling points? [1]

- | | |
|-------------------------|----------------------|
| (i) Simple distillation | (ii) Solution |
| (iii) Separating funnel | (iv) Crystallisation |

19. Which of the following separates miscible liquids with closer boiling points? [1]

- | | |
|-------------------------------|----------------------|
| (i) Filtration | (ii) Suspension |
| (iii) Fractional distillation | (iv) Crystallisation |

20. Which of the following separates immiscible liquids of different densities? [1]

- | | |
|-----------------------------|------------------------|
| (i) Fractional distillation | (ii) Crystallisation |
| (iii) Simple distillation | (iv) Separating funnel |

21. Which of the following separates a sublimable solid from suitable non-sublimable material? [1]

- | | |
|-------------------------------|------------------------|
| (i) Homogeneous mixture | (ii) Separating funnel |
| (iii) Fractional distillation | (iv) Sublimation |

22. Which of the following separates components such as pigments? [1]

- (i) Chromatography
- (ii) Centrifugation
- (iii) Solute
- (iv) Simple distillation

23. Which of the following combines useful material properties? [1]

- | | |
|-----------------|------------------------|
| (i) Evaporation | (ii) Separating funnel |
| (iii) Alloy | (iv) Sublimation |

24. Which entry is correctly associated with this feature: it does not show visibly separate regions at the observation scale? [1]

- | | |
|-------------------------|--------------------------|
| (i) Homogeneous mixture | (ii) Simple distillation |
| (iii) Crystallisation | (iv) Sedimentation |

25. A. What problems could arise if every scientist used different symbols for the same element? [2]

OR

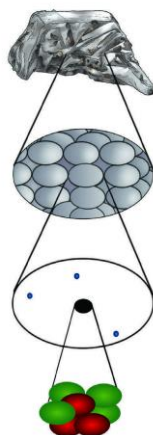
B. A neutral model atom in a particle-counting task contains 9 protons and 12 neutrons. Determine its atomic number and mass number.

26. Write the electronic configuration of the elements having atomic numbers 12, 16 and 18. [3]

27. At a Tiwari Academy science workshop, students discuss the following task. Write a short scientific note on Cation and Ionic bond. Give one defining feature of each, then describe the role or significance of each. [3]

28. A. The Figure traces a piece of lithium down to the structure of an atom.

[4]



- (a) What determines that an atom is lithium?
- (b) How many electrons does a neutral lithium atom contain?
- (c) Write its shell configuration.
- (d) If its mass number is 7, how many neutrons does it have?

OR

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

A: A positively charged projectile used in the gold-foil experiment.

B: Atoms of the same element with different neutron numbers.

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

29. A. A reaction leaves no visible solid or liquid in an open container. Give two reasons why “all matter was destroyed” is not a valid conclusion. State the law governing the total mass in this reaction. Is the identity of an element determined by its proton number or by the number of molecules present? Explain why changing the amount of a pure compound does not change its formula.

[5]

OR

B. Answer the following about Chemical formula and Atomicity:

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

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Which of the following describes how fast an object moves?

[1]

- (i) Uniform acceleration
- (ii) Uniform motion
- (iii) Speed
- (iv) Distance

31. Identify the scientific term: cooler air flowing downslope at night? [1]

- (i) Albedo
- (ii) Mountain breeze
- (iii) Deforestation
- (iv) Carbon cycle

32. Identify the scientific term: circulation of water through evaporation, condensation and precipitation with other transfers? [1]

- (i) Decomposition
- (ii) Denitrification
- (iii) Valley breeze
- (iv) Water cycle

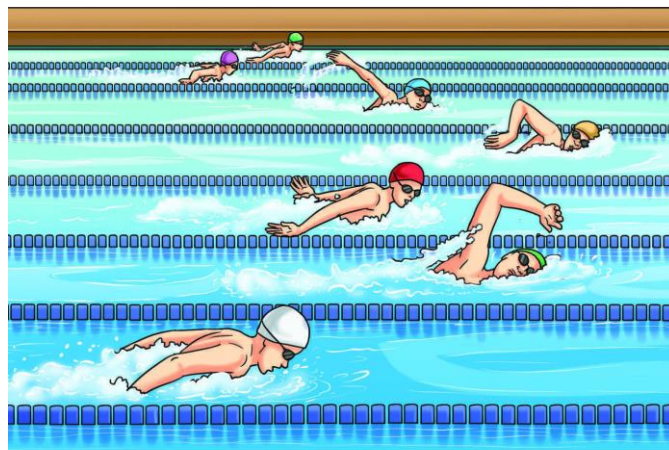
33. A. When you pedal a bicycle on a flat road, your muscles supply energy. In what forms does this muscular energy appear as you ride? [2]

OR

B. A 250 N load acts 0.20 m from a lever pivot. An effort is applied 0.50 m on the other side. Find the load moment and effort needed for balance.

34. Think of a cricket ball being hit for a six. You want to make a simple model. What details would you include? What would you ignore? [2]

35. A. Observe the swimmer in the Figure. [3]



- (a) What reference object could be used to describe the swimmer's motion?
- (b) If the swimmer returns to the starting point, what is the total displacement?
- (c) Would the total distance also be zero? Explain.

OR

B. A toy car slows uniformly from 25 m s^{-1} to rest in 2 s. Calculate its acceleration and stopping distance. State the SI unit of displacement.

36. A student is slowly lifted straight up in an elevator from the ground level to the top floor of a building. Later, the same student climbs the staircase, all the way to the top. Given that the height of the building is $h = 72.5 \text{ m}$, acceleration due to gravity is $g = 10 \text{ m s}^{-2}$ and student's mass is $m = 50 \text{ kg}$.

(i) Find the gain in the potential energy if the student is lifted straight up to the top.

(ii) Find the gain in the potential energy when the student climbs the stairs to the same top.

(iii) What do you conclude about the dependence of the potential energy on the path taken? [3]

37. Observe the mountain landscape in the Figure. [3]



(a) Identify a component belonging to the hydrosphere.

(b) Identify a component of the lithosphere.

(c) Which sphere includes the living animals or plants?

38. A. A stationary 20 kg test cart is acted on by a constant net force of 80 N for 2 s . Find its acceleration and final velocity. Explain what happens to acceleration if the same net force acts on twice the mass. State whether the forces in a third-law pair act on the same body. [4]

OR

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

A: Force multiplied by the time of action for a constant or average force.

B: The tendency to resist changes in a body's state of motion.

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

39. Answer the following about Wavelength and Echo:

(a) State one defining feature and one role of Wavelength.

(b) State one defining feature and one role of Echo.

(c) Give one application or example illustrating the significance of Wavelength. [5]