

SCIENCE EXPLORATION

Sample Question Paper 16

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. Identify the scientific term: a specialised cell with a cell body and long conducting processes? [1]
(i) Neuron (ii) Xylem
(iii) Apical meristem (iv) Cartilage
2. Which of the following receives pollen? [1]
(i) Petal (ii) Anther
(iii) Stigma (iv) Ovulation
3. Which colourless plastid stores materials such as starch, oils or proteins? [1]
(i) Smooth endoplasmic reticulum (ii) Central vacuole
(iii) Leucoplast (iv) Rough endoplasmic reticulum
4. Which of the following provides a route for pollen-tube growth? [1]
(i) Budding (ii) Stem cutting
(iii) Vegetative propagation (iv) Style
5. Which of the following develops into the fruit after fertilisation? [1]
(i) Pollen tube (ii) Petal
(iii) Ovary of a flower (iv) Sepal
6. Which of the following develops into a seed after fertilisation? [1]
(i) Stigma (ii) Sepal
(iii) Testis (iv) Ovule

7. Which of the following carries out life processes without membrane-bound organelles? [1]

- | | |
|---------------------|-----------------------|
| (i) Golgi apparatus | (ii) Prokaryotic cell |
| (iii) Mitosis | (iv) Plasmolysis |

8. Which of the following protects the flower before it opens? [1]

- | | |
|-------------------|-------------|
| (i) Uterus | (ii) Anther |
| (iii) Pollen tube | (iv) Sepal |

9. Which of the following can attract animal pollinators? [1]

- | | |
|---------------|------------------|
| (i) Sepal | (ii) Pollen tube |
| (iii) Puberty | (iv) Petal |

10. A. If the skin cells start dividing by meiosis instead of mitosis, what do you think will happen to a cut on the skin? [2]

OR

B. State one defining feature of each of the following: Plasmolysis and Chloroplast.

11. State one defining feature of each of the following: Chlorenchyma and Ciliated epithelium. [2]

12. A. The Figure shows a bud developing on Hydra. [2]



- (a) Is the new outgrowth a gamete or a developing individual?
(b) Name the process.

OR

B. State one defining feature of each of the following: Binary fission and Stem cutting.

13. Write a short scientific note on Eukaryotic cell and Central vacuole. Give one defining feature of each, then describe the role or significance of each. [3]

14. Write a short scientific note on Animalia and Class. Give one defining feature of each, then describe the role or significance of each. [3]

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

A: Long striated muscle fibres usually under voluntary control.

B: Connective tissue joining one bone to another.

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

16. A. The Figure shows Marchantia. [5]



(a) Name its plant group.

(b) Does it possess the true vascular tissues of a fern?

(c) Why is a moist environment important for its reproduction?

(d) How do its anchoring structures differ from true roots?

(e) State one reason not to classify it as a flowering plant.

OR

B. Answer the following about Bryophytes and Cnidaria:

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

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

(c) Give one application or example illustrating the significance of Bryophytes.

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which of the following separates an insoluble solid from a liquid? [1]

(i) Filtration

(ii) Solvent

(iii) Suspension

(iv) Homogeneous mixture

18. An atom ^{23}A has 11 electrons. Find the number of neutrons in it. [1]

19. Which entry is correctly associated with this feature: it uses element symbols and subscripts? [1]

(i) Chemical formula

(ii) Law of constant proportions

(iii) Cation

(iv) Ionic bond

20. Which entry is correctly associated with this feature: they occupy the highest filled shell in the simple shell model? [1]

- | | |
|-----------------------|------------------|
| (i) Valence electrons | (ii) Mass number |
| (iii) Bohr model | (iv) Neutron |

21. Which entry is correctly associated with this feature: it depends on how an outer shell can be completed? [1]

- | | |
|-------------------------|-------------------------|
| (i) Valency | (ii) L shell |
| (iii) Valence electrons | (iv) Nucleus of an atom |

22. Which entry is correctly associated with this feature: it does not contain a concentrated nucleus? [1]

- | | |
|---------------|-------------------------------|
| (i) Proton | (ii) Thomson model |
| (iii) Neutron | (iv) Electronic configuration |

23. Which entry is correctly associated with this feature: it places most atomic mass in the nucleus? [1]

- | | |
|--------------------------|-----------------------|
| (i) Alpha particle | (ii) Rutherford model |
| (iii) Nucleus of an atom | (iv) Neutron |

24. Which entry is correctly associated with this feature: its electrons do not radiate continuously in permitted orbits? [1]

- | | |
|------------------|---------------------------|
| (i) K shell | (ii) Dalton atomic theory |
| (iii) Bohr model | (iv) Electron |

25. A. Rutherford found that a few α -particles bounced back sharply. How does this single surprising result completely rule out Thomson's 'plum pudding model' of the atom? [2]

OR

B. A neutral model atom in a particle-counting task contains 4 protons and 7 neutrons. Determine its atomic number and mass number.

26. A. Write a short scientific note on Solute and Suspension. Give one defining feature of each, then describe the role or significance of each. [3]

OR

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

27. A reaction produces 18 g water from hydrogen and oxygen in a mass ratio of 1:8. Determine how much of each reactant is consumed. State the law governing the total mass in this reaction. [3]

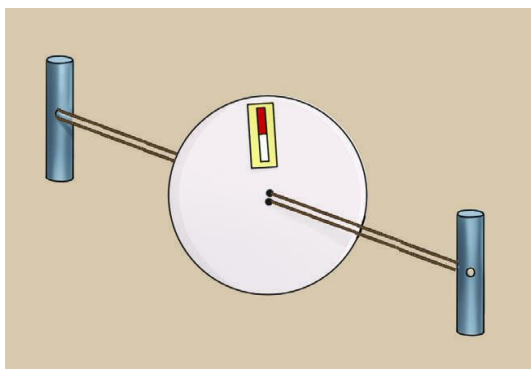
28. Write the formulae for the compounds formed by the reaction of:

- (i) Magnesium and nitrogen
- (ii) Lithium and nitrogen
- (iii) Sodium and sulfur
- (iv) Aluminium and oxygen

[4]

29. A. The Figure shows a paperfuge made from simple materials.

[5]



- (a) Which laboratory separation method does it imitate?
- (b) What supplies its motion?
- (c) What kind of sample property permits its components to separate?
- (d) State one benefit of this design.
- (e) Why is a model demonstration not proof that every sample will separate equally well?

OR

B. Answer the following about Heterogeneous mixture and Evaporation:

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

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Identify the scientific term: daytime airflow upslope towards warmer mountain surfaces?

[1]

- | | |
|---------------------|-------------------|
| (i) Mountain breeze | (ii) Atmosphere |
| (iii) Valley breeze | (iv) Carbon cycle |

31. Identify the scientific term: a contact force opposing relative sliding or its tendency?

[1]

- | | |
|--------------------------|---------------------------|
| (i) Friction | (ii) Newton's second law |
| (iii) Newton's third law | (iv) Action–reaction pair |

32. A Tiwari Academy practice worksheet presents this problem. Which of the following measures how far an object travels? [1]

- (i) Uniform circular motion (ii) Position–time graph
(iii) Distance (iv) Reference frame

33. While exercising, a girl lifts a dumbbell and slowly lowers it down. Identify when the girl does positive work on the dumbbell and when she does negative work on it. [2]

34. Suppose you ride a bicycle from your school to your home. You want to model the time it takes to go home from school. What details would you keep? What details could you ignore? Suggest why ignoring some details may actually be useful. [2]

35. Write a short scientific note on Average speed and Uniform motion. Give one defining feature of each, then describe the role or significance of each. [3]

36. A vehicle enters an uphill escape ramp beside a road, as shown in the Figure. [3]



- (a) Which energy store increases as the vehicle climbs?
(b) With no energy supplied by the engine, what happens to its kinetic energy as it climbs?
(c) How does friction with the rough ramp help stop the vehicle?

37. A. For a ball moving on a smooth frictionless surface, choose the appropriate option that will make the following statements physically correct.

- (i) If no net force is applied on the ball, the velocity of the ball will remain the same/increase/decrease.
(ii) If a net force is applied on the ball in the direction of its motion, the magnitude of the velocity of the ball will remain the same/ increase/decrease.
(iii) If a net force is applied on the ball in a direction opposite to the direction of its motion, the magnitude of the velocity of the ball will remain the same/increase/decrease. [3]

OR

B. A laboratory trolley of mass 18 kg experiences a forward pull of 78 N and an opposing frictional force of 6 N. Calculate net force and acceleration. Explain what happens to acceleration if the same net force acts on twice the mass.

38. A. What are the impacts of deforestation on the Earth's oxygen and carbon cycles? What are the other consequences of deforestation? [4]

OR

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

A: Conversion of atmospheric nitrogen into usable nitrogen compounds.

B: Conversion of some nitrogen compounds back to atmospheric nitrogen by bacteria.

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

39. A. Use the slinky model in the Figure to answer the following. [5]



- (a) What are the closely spaced coil regions called?
- (b) What are the more widely spaced regions called?
- (c) How do coil displacements compare with the direction of propagation in a longitudinal disturbance?
- (d) What distance corresponds to one wavelength?
- (e) Do the compressions represent permanent transport of the same coils along the slinky?

OR

B. Answer the following about Transverse wave and Time period:

- (a) State one defining feature and one role of Transverse wave.
- (b) State one defining feature and one role of Time period.
- (c) Give one application or example illustrating the significance of Transverse wave.