

SCIENCE EXPLORATION

Sample Question Paper 8

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: seed plants whose seeds are not enclosed within fruits? [1]
(i) Angiosperms (ii) Pteridophytes
(iii) Gymnosperms (iv) Bryophytes
2. During a Tiwari Academy science-club session, a group works on this task. Identify the scientific term: a small motile male gamete with a tail? [1]
(i) Puberty (ii) Budding
(iii) Tissue culture (iv) Sperm
3. Identify the scientific term: a lining of tall cells? [1]
(i) Cardiac muscle (ii) Columnar epithelium
(iii) Parenchyma (iv) Lateral meristem
4. Identify the scientific term: a large female gamete containing stored cytoplasm? [1]
(i) Binary fission (ii) Vegetative propagation
(iii) Ovum (iv) Zygote
5. Identify the scientific term: flowering plants with seeds enclosed in fruits? [1]
(i) Pteridophytes (ii) Angiosperms
(iii) Gymnosperms (iv) Bryophytes

6. Identify the scientific term: epithelial cells bearing tiny moving hair-like projections? [1]

(i) Ciliated epithelium

(ii) White blood cell

(iii) Lateral meristem

(iv) Sclerenchyma

7. Identify the scientific term: loose connective tissue filling spaces between organs? [1]

(i) Parenchyma

(ii) Neuron

(iii) Areolar tissue

(iv) Lateral meristem

8. Identify the scientific term: connective tissue with cells that store fat? [1]

(i) Epidermis

(ii) Smooth muscle

(iii) Ligament

(iv) Adipose tissue

9. Identify the scientific term: strong fibrous connective tissue joining muscle to bone? [1]

(i) Chlorenchyma

(ii) Tendon

(iii) Cartilage

(iv) Bone

10. State one defining feature of each of the following: Spore formation and Stigma. [2]

11. A. State one defining feature of each of the following: Osmosis and Meiosis. [2]

OR

B. State one defining feature of each of the following: Mitochondrion and Ribosome.

12. How would a scientist justify choosing cellular organisation as a more fundamental characteristic for the basis of classification rather than the presence of xylem and phloem? [2]

13. A. The Figure shows tissues around a knee joint. [3]



(a) Which tissue attaches a muscle to a bone?

(b) Which tissue joins one bone to another?

(c) What tissue cushions the articulating bone surfaces?

OR

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

14. If you find a new organism in a pond, what features will you observe to classify it and why? [3]

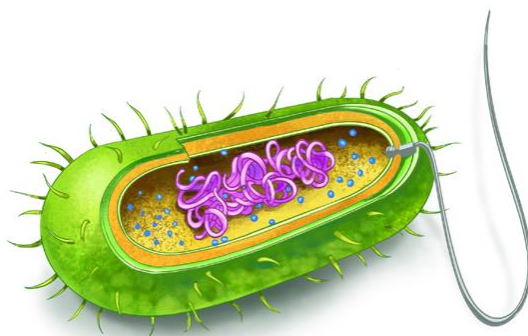
15. Two entries on a science display have lost their headings.

A: Release of an egg from an ovary.

B: Raising plants from small pieces of tissue under controlled conditions.

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

16. A. The Figure represents a bacterial cell. [5]



(a) Name the cell-organisation category shown.

(b) Is its genetic material enclosed by a nuclear envelope?

(c) Name a site of protein synthesis present in this cell.

(d) Would mitochondria normally be present?

(e) Why does the absence of a true nucleus not mean that the cell lacks DNA?

OR

B. Answer the following about Ribosome and Cell wall:

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

(b) State one defining feature and one role of Cell wall.

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

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Identify the scientific term: the maximum mass of solute dissolving in a stated mass of solvent at a specified temperature? [1]

(i) Separating funnel

(ii) Chromatography

(iii) Alloy

(iv) Solubility

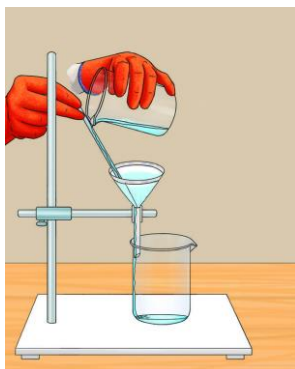
18. Which of the following describes the mass of the molecule on the atomic mass scale? [1]
- (i) Law of constant proportions (ii) Compound
(iii) Molecular mass (iv) Formula unit mass
19. Identify the scientific term: scattering of a light beam by dispersed particles? [1]
- (i) Solution (ii) Tyndall effect
(iii) Sublimation (iv) Separating funnel
20. Identify the scientific term: passing a mixture through a porous barrier that retains insoluble particles? [1]
- (i) Saturated solution (ii) Filtration
(iii) Tyndall effect (iv) Decantation
21. Identify the scientific term: the second electron shell? [1]
- (i) Nucleus of an atom (ii) Rutherford model
(iii) Alpha particle (iv) L shell
22. Which of the following provides a mass measure for ionic compounds? [1]
- (i) Formula unit (ii) Formula unit mass
(iii) Atomicity (iv) Covalent bond
23. Why do cities with a lot of smoke and dust in the air often look hazy? [1]
24. Which of the following requires equal total reactant and product masses? [1]
- (i) Chemical formula (ii) Law of conservation of mass
(iii) Atomicity (iv) Ionic bond
25. A. Write the formulae for the compounds formed from the following pairs of ions: [2]
- (i) Fe^{3+} and OH^-
(ii) K^+ and CO_3^{2-}
- OR**
- B. Find the formula unit mass of magnesium hydroxide, $\text{Mg}(\text{OH})_2$.
Atomic mass — Mg = 24 u; O = 16 u; H = 1 u.
26. Why can a reaction equation preserve the numbers of each type of atom while changing the total number of molecules? Use water formation as an example. State the law governing the total mass in this reaction. [3]

27. A. A neutral model atom in a particle-counting task contains 6 protons and 7 neutrons. Determine its atomic number and mass number. How many electrons does it contain? [3]

OR

B. Write a short scientific note on Atomic number and Bohr model. Give one defining feature of each, then describe the role or significance of each.

28. The Figure shows hot filtration during preparation of crystals. [4]



- (a) What does the filter paper retain?
- (b) What is the liquid passing through called?
- (c) Why is filtration performed before cooling for crystallisation?
- (d) Does the paper remove all dissolved impurities?

29. A. A neutral model atom in a particle-counting task contains 7 protons and 8 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 L shell and Alpha particle:

- (a) State one defining feature and one role of L shell.
- (b) State one defining feature and one role of Alpha particle.
- (c) Give one application or example illustrating the significance of L shell.

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Identify the scientific term: energy associated with height in a gravitational field? [1]

- (i) Watt
- (ii) Positive work
- (iii) Gravitational potential energy
- (iv) Power

31. Identify the scientific term: the tendency to resist changes in a body's state of motion? [1]

(i) Newton's second law

(ii) Inertia

(iii) Unbalanced forces

(iv) Balanced forces

32. Identify the scientific term: energy stored through suitable deformation? [1]

(i) Elastic potential energy

(ii) Lever

(iii) Fulcrum

(iv) Joule

33. A. Sound travels much farther in water than light, and thus, is used for various underwater applications. A sonar signal sent to find the depth of ocean takes 4 s to return. What is the depth of the ocean at that location if the speed of sound in seawater is 1500 m s^{-1} ? [2]

OR

B. You clap in an empty corridor and hear an echo after 0.5 s. If the speed of sound in air is 340 m s^{-1} , calculate your distance from the wall.

34. A claim about a food item is shared widely online but gives no measurements. Suggest two features of a scientific investigation of the claim. [2]

35. A. Make a list of different types of musical instruments and identify their vibrating parts which produce sound. [3]

OR

B. A vibrating blade completes 360 oscillations in 2 s. Find its frequency and time period. What happens to pitch if the source frequency increases?

36. A car of mass 1000 kg starts from rest and reaches a speed of 72 km h^{-1} in 10 seconds. Calculate the power of the engine required to achieve this start. [3]

37. A trolley is pulled using a string and pulley in the Figure. [3]



(a) Which law links its resultant force, mass and acceleration?

(b) With constant mass, what happens to acceleration if the resultant force is doubled?

(c) With constant resultant force, what happens if the moving mass is tripled?

38. Observe the road signs in the Figure.

[4]



(a) Which physical quantity is restricted by these signs?

(b) Express 36 km h^{-1} in m s^{-1} .

(c) Why is a stated speed limit not a specification of velocity?

(d) At 10 m s^{-1} , how far does a vehicle travel in a two-second reaction interval?

39. A. Explain the processes involved in the nitrogen cycle. How would life on Earth be affected if nitrogen were not cycled?

[5]

OR

B. Answer the following about Sea breeze and Carbon cycle:

(a) State one defining feature and one role of Sea breeze.

(b) State one defining feature and one role of Carbon cycle.

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