

SCIENCE EXPLORATION

Sample Question Paper 7

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: pollen reaching a stigma of the same flower or another flower on the same plant? [1]
(i) Layering (ii) Tissue culture
(iii) Puberty (iv) Self-pollination
2. Identify the scientific term: pollen moving from one plant to a flower of another plant of the same species? [1]
(i) Stem cutting (ii) Anther
(iii) Cross-pollination (iv) Ovum
3. Identify the scientific term: a tube growing out of a germinating pollen grain? [1]
(i) Pollen tube (ii) Layering
(iii) Cross-pollination (iv) Stigma
4. Identify the scientific term: an outer layer covering young plant organs? [1]
(i) Tendon (ii) Areolar tissue
(iii) Epidermis (iv) Sclerenchyma
5. Identify the scientific term: fusion of a male and a female gamete? [1]
(i) Fertilisation (ii) Petal
(iii) Ovary of a flower (iv) Style
6. Identify the scientific term: a pair of specialised epidermal cells surrounding a pore? [1]
(i) Guard cells (ii) Chlorenchyma
(iii) Bone (iv) Collenchyma

7. Identify the scientific term: a sheet of thin flattened cells? [1]

- | | |
|----------------------------|--------------------------|
| (i) Tendon | (ii) Collenchyma |
| (iii) Intercalary meristem | (iv) Squamous epithelium |

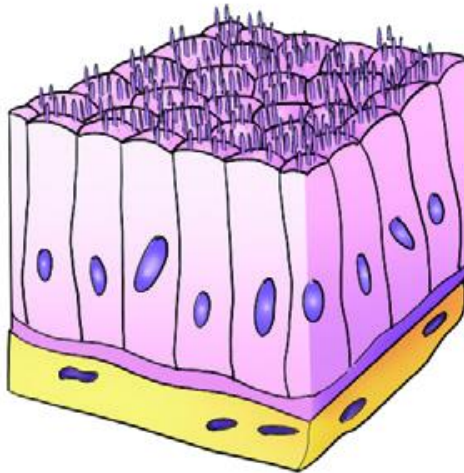
8. Identify the scientific term: a male reproductive organ that forms sperm? [1]

- | | |
|-------------|--------------|
| (i) Testis | (ii) Puberty |
| (iii) Style | (iv) Sepal |

9. Identify the scientific term: a lining made of approximately cube-shaped cells? [1]

- | | |
|--------------------|--------------------------|
| (i) Red blood cell | (ii) Cuboidal epithelium |
| (iii) Xylem | (iv) Cartilage |

10. A. The Figure represents ciliated epithelial tissue. [2]



- (a) Name the hair-like surface structures.
(b) What useful movement do these structures produce?

OR

B. State one defining feature of each of the following: Cartilage and Apical meristem.

11. What would happen if gametes are formed by mitotic divisions? [2]

12. State one defining feature of each of the following: Aerenchyma and Ligament. [2]

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

14. A farmer wants to produce a large number of genetically identical plants quickly. Suggest suitable reproduction methods and explain why they are effective. [3]

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

A: Multicellular eukaryotes without cell walls.

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]

OR

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

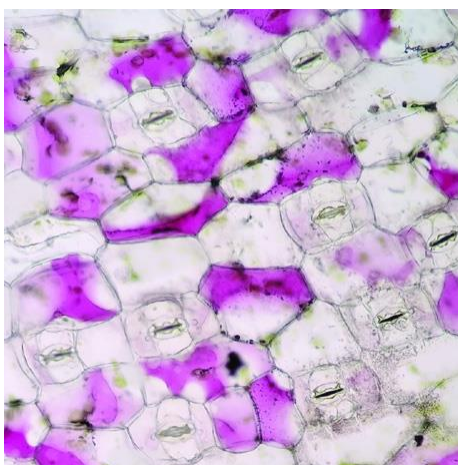
A: Marine animals with spiny skin and a water vascular system.

B: Eukaryotes that absorb nutrients and lack chlorophyll.

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

16. A. The Figure shows leaf cells after exposure to a concentrated sugar solution.

[5]



(a) Name the shrinkage phenomenon illustrated.

(b) In which direction has water moved overall?

(c) Which cell component retains its rigid outline?

(d) What would you predict after viable cells are returned to dilute water?

(e) Why is this not simply loss of the cell wall?

OR

B. Answer the following about Meiosis and Rough endoplasmic reticulum:

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

(b) State one defining feature and one role of Rough endoplasmic reticulum.

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

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Identify the scientific term: the first energy shell nearest the nucleus?

[1]

(i) Isotopes

(ii) Valence electrons

(iii) Proton

(iv) K shell

18. Identify the scientific term: the substance dissolved in a solution? [1]
(i) Tyndall effect (ii) Solute
(iii) Solvent (iv) Separating funnel
19. Identify the scientific term: the medium in which another substance is dissolved? [1]
(i) Solubility (ii) Solvent
(iii) Crystallisation (iv) Solute
20. Which of the following acts as an ion when forming a compound? [1]
(i) Chemical formula (ii) Law of conservation of mass
(iii) Molecule (iv) Polyatomic ion
21. Identify the scientific term: a solution containing the maximum amount of dissolved solute at a stated temperature? [1]
(i) Tyndall effect (ii) Chromatography
(iii) Centrifugation (iv) Saturated solution
22. Which of the following shows the kinds and relative numbers of atoms or ions? [1]
(i) Chemical formula (ii) Cation
(iii) Law of conservation of mass (iv) Relative atomic mass
23. Which of the following represents composition without implying isolated molecules? [1]
(i) Molecular mass (ii) Anion
(iii) Law of constant proportions (iv) Formula unit
24. Which of the following allows comparison of atomic masses? [1]
(i) Relative atomic mass (ii) Ionic bond
(iii) Chemical formula (iv) Element
25. A. The Law of Definite Proportions holds true for compounds but not for mixtures. Give reason. [2]

OR

B. Find the molecular mass of methane (CH_4).
Atomic mass: C = 12 u; H = 1 u.

26. Could an orange or a lemon, which also contain seeds inside soft pulp, be a good comparison? In what ways does it match Thomson's idea and where does it fall short? [3]

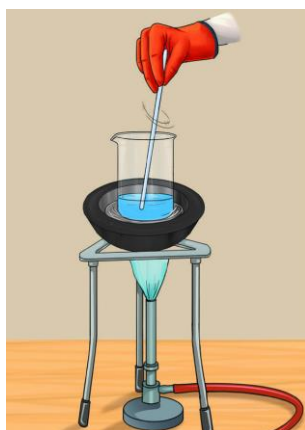
27. A. A closed reaction vessel and its contents weigh 125 g before mixing and 125 g afterwards, although the colour changes. What do these two observations establish? State the law governing the total mass in this reaction. [3]

OR

B. Write a short scientific note on Cation and Relative atomic mass. Give one defining feature of each, then describe the role or significance of each.

28. In an atom, there are 12 protons and 12 neutrons in the nucleus. Now, imagine that all the electrons are replaced with some hypothetical particles that have the same charge as electrons but are 500 times heavier. What effect will this replacement have on the atom's: (i) Atomic number (ii) Atomic mass (iii) Mass number (iv) Overall charge [4]

29. A. The Figure shows a solution being heated and stirred before crystallisation. [5]



- (a) Why can heating help dissolve more of many solid solutes?
- (b) What does saturated mean at a stated temperature?
- (c) Why is the temperature part of the description?
- (d) What may happen when the hot saturated solution cools?
- (e) Why should the mixture be stirred during preparation?

OR

B. Answer the following about Crystallisation and Heterogeneous mixture:

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

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. An object is moving with a constant velocity. Is there a net force acting upon it? [1]

31. Identify the scientific term: the rigid outer rocky part of Earth? [1]

(i) Lithosphere

(ii) Nitrogen fixation

(iii) Deforestation

(iv) Sea breeze

32. Identify the scientific term: the living component of the Earth system? [1]

(i) Deforestation

(ii) Biosphere

(iii) Denitrification

(iv) Cryosphere

33. A. A Tiwari Academy practice worksheet presents this problem. A hoist raises a 10 kg load through 3 m in 2 s at steady speed. Find the gain in gravitational potential energy and useful average power. Take $g = 10 \text{ m s}^{-2}$. [2]

OR

B. State one defining feature of each of the following: Negative work and Joule.

34. A fuel calculation combines litres, pounds and kilograms without conversion. Explain the problem and suggest a preventive step. [2]

35. Explain how climate change affects the water cycle. Illustrate with examples. [3]

36. A. A jet aircraft of mass 15000 kg lands on the deck of an aircraft carrier. To stop the aircraft within the short length of the deck a hook on the aircraft's tail is caught in a wire stretched across the deck. The wire exerts an approximately constant backward force of 367500 N and stops the jet within 100 m. What was the velocity of the aircraft just before the wire caught the hook? [3]

OR

B. Write a short scientific note on Lever and Elastic potential energy. Give one defining feature of each, then describe the role or significance of each.

37. A. The Figure shows a rubber band supporting coins. [3]



(a) What kind of force is exerted by the stretched rubber band?

(b) Why does adding coins tend to stretch the band further?

(c) Are the forces balanced when the coins hang motionless?

OR

B. A stationary 8 kg test cart is acted on by a constant net force of 32 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.

38. Use the clock shown in the Figure to consider the tip of its minute hand. **[4]**



- (a) What type of path does the tip trace?
- (b) What is its displacement after one hour?
- (c) If the hand is 7 cm long, what distance does the tip travel in one hour? Use $\pi = 22/7$.
- (d) What is the magnitude of displacement after half an hour?

39. An echo from a test wall returns after 0.7 s. Sound speed is 340 m s^{-1} . Find the total path length and distance to the wall. What happens to pitch if the source frequency increases? Explain why the wave requires a material medium. Do medium particles travel all the way from source to receiver? Explain. **[5]**