

SCIENCE EXPLORATION

Sample Question Paper 10

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: release of an egg from an ovary? **[1]**
(i) Ovulation (ii) Testis
(iii) Sperm (iv) Cross-pollination
2. Identify the scientific term: a barrier method used during sexual intercourse? **[1]**
(i) Menstruation (ii) Ovule
(iii) Sperm (iv) Condom
3. Identify the scientific term: the single cell formed immediately after gamete fusion? **[1]**
(i) Style (ii) Zygote
(iii) Pollen tube (iv) Cross-pollination
4. Identify the scientific term: a plastid rich in non-green pigments? **[1]**
(i) Eukaryotic cell (ii) Osmosis
(iii) Diffusion (iv) Chromoplast
5. Identify the scientific term: animals with jointed appendages and an external skeleton? **[1]**
(i) Pteridophytes (ii) Genus
(iii) Mammalia (iv) Arthropoda
6. Identify the scientific term: a colourless plastid common in storage tissues? **[1]**
(i) Leucoplast (ii) Ribosome
(iii) Diffusion (iv) Chloroplast

7. Identify the scientific term: a cell whose genetic material is not enclosed in a nuclear envelope? [1]

(i) Cell membrane

(ii) Osmosis

(iii) Chromoplast

(iv) Prokaryotic cell

8. Identify the scientific term: a cell with a true nucleus and membrane-bound organelles? [1]

(i) Cell wall

(ii) Eukaryotic cell

(iii) Golgi apparatus

(iv) Central vacuole

9. Identify the scientific term: one nuclear division that usually produces two genetically similar daughter cells? [1]

(i) Mitosis

(ii) Cell membrane

(iii) Smooth endoplasmic reticulum

(iv) Mitochondrion

10. A plant cell and an animal cell are of the same size. (i) Which cell will have a larger vacuole? Give reasons. (ii) What assumptions are you making to answer the question above? [2]

11. State one defining feature of each of the following: Cross-pollination and Ovary of a flower. [2]

12. A. If all unicellular organisms were grouped into a single kingdom, what problems would arise? [2]

OR

B. State one defining feature of each of the following: Fossil and Arthropoda.

13. The Figure shows a chloroplast. [3]



(a) Name its principal green pigment.

(b) State the process that this pigment supports.

(c) What is the main energy input for that process?

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

OR

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

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

A: Aquatic animals with numerous pores and a canal system.

B: Mostly unicellular eukaryotes with diverse modes of nutrition.

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: Plants with true roots, stems, leaves and vascular tissue but no seeds.

B: Multicellular eukaryotes generally containing chlorophyll.

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

16. The Figure shows a person bending before a jump.

[5]



(a) Name the voluntary muscle type primarily moving the limbs.

(b) Why do muscles need attachments to bones?

(c) What kind of movement occurs at the knee?

(d) Why are several tissues needed for the jump?

(e) State one observation that would distinguish a stiff-leg jump from a normal jump.

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Identify the scientific term: carefully pouring off liquid above settled material?

[1]

(i) Chromatography

(ii) Solute

(iii) Filtration

(iv) Decantation

18. Which of the following identifies an element uniquely? [1]
(i) Nucleus of an atom (ii) Isotopes
(iii) Bohr model (iv) Atomic number
19. Which of the following distinguishes monoatomic, diatomic and other elemental forms? [1]
(i) Atomicity (ii) Covalent bond
(iii) Molecule (iv) Relative atomic mass
20. Which entry is correctly associated with this feature: it is commonly formed by loss of electrons? [1]
(i) Cation (ii) Law of constant proportions
(iii) Law of conservation of mass (iv) Element
21. Which of the following counts the nucleons? [1]
(i) Neutron (ii) Electronic configuration
(iii) Mass number (iv) Alpha particle
22. Which entry is correctly associated with this feature: it is commonly formed by gain of electrons? [1]
(i) Anion (ii) Chemical formula
(iii) Element (iv) Covalent bond
23. Which of the following have different mass numbers? [1]
(i) Bohr model (ii) Dalton atomic theory
(iii) Isotopes (iv) Proton
24. Which of the following illustrates that mass number alone does not identify an element? [1]
(i) Isobars (ii) Nucleus of an atom
(iii) Thomson model (iv) Valence electrons
25. Suppose you made up your own 'atom', as Thomson described, using clay for the positive charge and small beads for the electrons spread through it. What will happen if:
(i) the positive charge on the clay is lesser than the total negative charge of the beads?
(ii) by mistake, the clay itself carries a bit of negative charge? Would your model still represent a neutral atom? [2]
26. A. Write a short scientific note on Homogeneous mixture and Filtration. Give one defining feature of each, then describe the role or significance of each. [3]

OR

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

27. A. Identify the number of electrons in the outermost shell of the following elements:

(i) $^{12}_{6}\text{C}$

(ii) $^{19}_{9}\text{F}$

(iii) $^{28}_{14}\text{Si}$

[3]

OR

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

28. The Figure shows the traditional Deg-Bhapka apparatus for producing fragrant extracts.

[4]



(a) What separation principle is used?

(b) What is the role of cooling the receiving vessel?

(c) Why can volatile fragrant components be carried into the receiver?

(d) Would a non-volatile dissolved solid ordinarily pass over in the same way?

29. A. A sample of a compound has the same elemental mass ratio before and after it is obtained by a different reaction route. Which law does this illustrate, and what does the result say about the compound? 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 Molecule and Law of constant proportions:

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

(b) State one defining feature and one role of Law of constant proportions.

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

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. If 20 compressions pass a point in 4 seconds, the frequency is [1]

- (i) 80 Hz
- (ii) 5 Hz
- (iii) 10 Hz
- (iv) 0.2 Hz

31. A Tiwari Academy practice worksheet presents this problem. Identify the scientific term: motion with equal velocity changes in equal time intervals? [1]

- (i) Uniform acceleration
- (ii) Uniform circular motion
- (iii) Velocity
- (iv) Reference frame

32. Identify the scientific term: the relation between net force and the rate of change of momentum? [1]

- (i) Newton's second law
- (ii) Conservation of momentum
- (iii) Net force
- (iv) Momentum

33. A. How is heat lost from the surface of the Earth? What is its significance? [2]

OR

B. State one defining feature of each of the following: Atmosphere and Denitrification.

34. Why can a heart be modelled as a pump without drawing every individual cell? State the benefit and one limitation. [2]

35. A. The Figure illustrates an airbag in a vehicle. [3]



- (a) What physical interval does an airbag increase during a collision?
- (b) Why does that reduce average impact force for a given momentum change?
- (c) Does the airbag remove the passenger's initial momentum before the collision starts?

OR

B. A stationary 12 kg test cart is acted on by a constant net force of 48 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.

36. A car starts from rest and accelerates uniformly to 20 m s^{-1} in 5 seconds. It then travels at 20 m s^{-1} for 10 seconds and finally applies the brake (with uniform acceleration) to stop in 6 seconds. Find the total distance travelled. [3]

37. If the Earth were a flat disc instead of a sphere, how would the patterns of solar radiation and temperature be different? [3]

38. A. An echo from a test wall returns after 1.1 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. [4]

OR

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

A: The perceived strength of a sound.

B: The auditory quality associated mainly with frequency.

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

39. The Figure shows a person pushing a wall that does not move. [5]



- (a) What is the displacement of the wall?
- (b) Calculate the work done on the wall by a 150 N push when it remains stationary.
- (c) Why can the person become tired despite this result?
- (d) Does applying a force always guarantee mechanical work?
- (e) If the same force moves an object 0.5 m along its direction, find the work.