

SCIENCE EXPLORATION

Sample Question Paper 9

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. Name the term: connective tissue joining one bone to another? **[1]**
(i) Adipose tissue (ii) Squamous epithelium
(iii) Ligament (iv) Red blood cell
2. Name the term: a tube leading from near the ovary towards the uterus? **[1]**
(i) Budding (ii) Stem cutting
(iii) Filament (iv) Oviduct
3. Name the term: aquatic animals with numerous pores and a canal system? **[1]**
(i) Amphibia (ii) Porifera
(iii) Bryophytes (iv) Genus
4. Name the term: aquatic animals with tentacles and a single digestive opening? **[1]**
(i) Cnidaria (ii) Echinodermata
(iii) Fossil (iv) Class
5. Name the term: bilaterally symmetrical animals with flattened bodies? **[1]**
(i) Biodiversity (ii) Nematoda
(iii) Fossil (iv) Platyhelminthes
6. Name the term: animals with long cylindrical unsegmented bodies? **[1]**
(i) Pteridophytes (ii) Platyhelminthes
(iii) Nematoda (iv) Pisces
7. Name the term: a muscular organ with a lining that changes during the cycle? **[1]**
(i) Ovulation (ii) Stem cutting
(iii) Sperm (iv) Uterus

8. Name the term: shedding of the uterine lining when pregnancy has not occurred? [1]

- | | |
|-----------------------|-------------------|
| (i) Ovary of a flower | (ii) Menstruation |
| (iii) Binary fission | (iv) Style |

9. Name the term: animals with bodies divided into repeated segments? [1]

- | | |
|----------------|-------------------|
| (i) Bryophytes | (ii) Annelida |
| (iii) Fossil | (iv) Biodiversity |

10. A. Give one feature each of: Condom and Zygote. [2]

OR

B. Give one feature each of: Ovulation and Condom.

11. What consequences would you predict for a plant cell if its cell wall were to become as flexible as a cell membrane? [2]

12. Give one feature each of: Ovulation and Self-pollination. [2]

13. For Cardiac muscle and Squamous epithelium, give one defining feature and one function or significance of each. [3]

14. A. Observe two different animals in your immediate environment. What features help you distinguish between them? How do these features help place them into different groups? [3]

OR

B. For Biodiversity and Echinodermata, give one defining feature and one function or significance of each.

15. The Figure shows the human skeleton. [4]

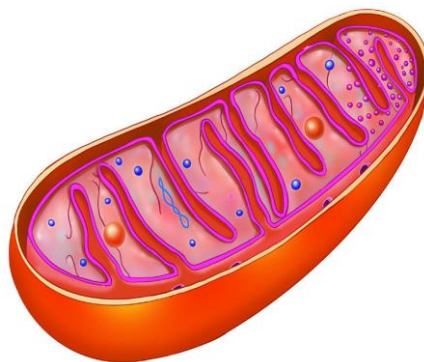


(a) State one protective function of the skeleton.

- (b) What makes bone a connective tissue?
- (c) What contributes to the hardness of its matrix?
- (d) Why are joints necessary for movement?

16. A. The Figure shows a mitochondrion.

[5]



- (a) Name the folds of its inner membrane.
- (b) What major process occurs in this organelle?
- (c) Name the usable energy carrier associated with its activity.
- (d) State one feature it shares with chloroplasts.
- (e) Why might a highly active muscle cell contain many such organelles?

OR

B. Give one defining feature and one role each of Ribosome and Lysosome. Also give one application or example of Ribosome.

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Name the term: the distribution of electrons among allowed shells?

[1]

- (i) Electronic configuration
- (ii) Mass number
- (iii) Isobars
- (iv) Proton

18. At a Tiwari Academy science workshop, students discuss the following task. Name the term: a theory describing matter in terms of atoms and their combinations?

[1]

- (i) Isobars
- (ii) Dalton atomic theory
- (iii) Isotopes
- (iv) Electronic configuration

19. Which of the following distinguishes a particular compound from mixtures of variable composition?

[1]

- (i) Law of constant proportions
- (ii) Cation
- (iii) Anion
- (iv) Law of conservation of mass

20. Which of the following contributes to bonding and electrical behaviour?

[1]

- (i) Nucleus of an atom
- (ii) Isotopes
- (iii) Rutherford model
- (iv) Electron

21. Which of the following determines the atomic number when counted? [1]
(i) Rutherford model (ii) Proton
(iii) Isotopes (iv) Thomson model
22. Which of the following contributes to nuclear mass? [1]
(i) Valency (ii) Neutron
(iii) Dalton atomic theory (iv) Thomson model
23. Which of the following cannot be broken into simpler substances by ordinary chemical methods? [1]
(i) Element (ii) Polyatomic ion
(iii) Molecule (iv) Law of conservation of mass
24. Which of the following has properties different from its constituent elements? [1]
(i) Cation (ii) Compound
(iii) Element (iv) Chemical formula
25. Is sublimation different from evaporation? Justify. [2]
26. A. The Figure shows natural crystal deposits in a cave. [3]



- (a) What process can form a solid crystal from a solution?
(b) State one condition that can make a dissolved material separate as crystals.
(c) Why can slow growth produce larger well-formed crystals?

OR

B. For Fractional distillation and Tyndall effect, give one defining feature and one function or significance of each.

27. For Crystallisation and Tyndall effect, give one defining feature and one function or significance of each. [3]

28. A. Choose the correct options and explain the reason for the correct and incorrect options in the context of Ernest Rutherford's gold foil experiment:

- (i) The experiment clearly showed the existence of neutrons in the nucleus.
- (ii) The results disproved the plum pudding model and led to the idea of a nucleus at the centre of the atom.
- (iii) The large deflection of a few alpha particles indicated that most of the mass of the atom and positive charge are packed into a tiny centre.
- (iv) The way alpha particles were deflected showed that electrons move around the nucleus.

[4]

OR

B. A neutral model atom in a particle-counting task contains 12 protons and 13 neutrons. Determine its atomic number and mass number. How many electrons does it contain? If it loses one electron, what is its charge?

29. A. Calcium carbonate reacts with hydrochloric acid and produces carbon dioxide. Why should a mass-conservation test retain the gas, and why must it also include the mass of the acid? 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. For magnesium chloride, MgCl_2 , use relative atomic masses $\text{Mg} = 24$, $\text{Cl} = 35.5$. Calculate the formula unit mass and the total mass of 5 formula units in u. Explain why formula unit is used here rather than an isolated molecule. State whether multiplying the number of formula units changes their composition. What must the total ionic charge in a formula unit be?

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Name the term: incoming solar radiation reaching a surface?

[1]

- | | |
|------------------|------------------------|
| (i) Lithosphere | (ii) Insolation |
| (iii) Sea breeze | (iv) Nitrogen fixation |

31. A hand cart loaded with vegetables collides with an identical but empty hand cart. During the collision:

[1]

- (i) the loaded cart exerts a force of larger magnitude on the empty cart.
- (ii) the empty cart exerts a force of larger magnitude on the loaded cart.
- (iii) neither cart exerts a force on the other.
- (iv) the loaded cart and the empty cart, both exert an equal magnitude of force on each other.

32. Name the term: motion covering equal distances in equal time intervals along a fixed direction? [1]

(i) Uniform motion

(ii) Average speed

(iii) Velocity–time graph

(iv) Position–time graph

33. The gravitational attraction on the surface of the Moon (lunar surface) is about $\frac{1}{6}$ th of that on the surface of the Earth. An astronaut can throw a ball up to a height of 8 m from the surface of the Earth. How far up will the ball thrown with the same upward velocity travel from the surface of the Moon? [2]

34. An estimate of rice needed for a family is several tonnes for one month. Explain how estimation can help detect an error before an exact calculation. [2]

35. A. Give one defining feature and one role each of Wavelength and Rarefaction. Also give one application or example of Wavelength. [5]

OR

B. A vibrating source makes 300 oscillations each second in air where sound travels at 340 m s^{-1} . Find its time period and wavelength. 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.

36. A. A person carries a box horizontally at constant height. [3]



(a) What is the angle between the upward supporting force and horizontal displacement?

(b) How much work does that upward force do on the box over this horizontal displacement?

(c) Does the zero-work result mean that the person uses no metabolic energy?

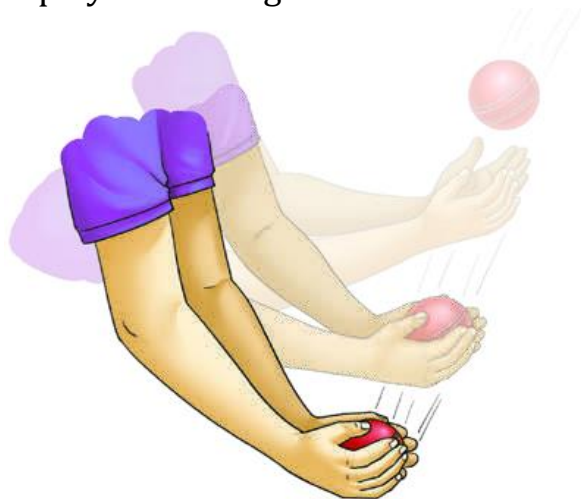
OR

B. For Kinetic energy and Joule, give one defining feature and one function or significance of each.

37. For Average speed and Uniform acceleration, give one defining feature and one function or significance of each. [3]

38. Describe the interrelationship between different spheres of the Earth. Illustrate with example how these spheres function in a delicate balance. [4]

39. A. The Figure shows a player catching a ball. [3]



- (a) Why does the player move the hands backward while receiving the ball?
- (b) For a fixed momentum change, how does increasing stopping time affect average force?
- (c) A 0.15 kg ball arrives at 20 m s^{-1} . Find the magnitude of momentum lost when it stops.

OR

B. For Conservation of momentum and Newton's third law, give one defining feature and one function or significance of each.