

SCIENCE EXPLORATION
Sample Question Paper 20
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. Which of the following includes ferns? **[1]**
(i) Angiosperms (ii) Thallophytes
(iii) Pteridophytes (iv) Bryophytes
2. Which of the following includes conifers? **[1]**
(i) Bryophytes (ii) Gymnosperms
(iii) Angiosperms (iv) Pteridophytes
3. Which of the following includes many familiar crops? **[1]**
(i) Thallophytes (ii) Pteridophytes
(iii) Bryophytes (iv) Angiosperms
4. During a Tiwari Academy science-club session, a group works on this task.
Which of the following uses water flow for feeding and exchange? **[1]**
(i) Amphibia (ii) Fish
(iii) Pteridophytes (iv) Porifera
5. Which of the following is the usual site of fertilisation in humans? **[1]**
(i) Ovule (ii) Vegetative propagation
(iii) Oviduct (iv) Fertilisation
6. Which of the following supports implantation and development of the embryo? **[1]**
(i) Vegetative propagation (ii) Ovulation
(iii) Uterus (iv) Budding
7. Which process involves periodic shedding of the uterine lining when pregnancy does not occur? **[1]**
(i) Spermatogenesis (ii) Ovary of a flower
(iii) Menstruation (iv) Testis

8. Which of the following makes an egg available for possible fertilisation? [1]
(i) Self-pollination (ii) Ovulation
(iii) Uterus (iv) Pollen tube

9. Which of the following helps prevent pregnancy and reduces transmission of many sexually transmitted infections? [1]
(i) Petal (ii) Spore formation
(iii) Condom (iv) Ovulation

10. Give one feature each of: Collenchyma and Red blood cell. [2]

11. A. Give one feature each of: Areolar tissue and Sclerenchyma. [2]

OR

B. Give one feature each of: Collenchyma and Cardiac muscle.

12. A. The Figure represents the meeting and fusion of two human gametes. [2]



(a) Name the process.
(b) Name the cell formed.

OR

B. Give one feature each of: Stem cutting and Petal.

13. A. For Diffusion and Nucleus, give one defining feature and one function or significance of each. [3]

OR

B. For Mitochondrion and Central vacuole, give one defining feature and one function or significance of each.

14. During the discussion in class, Rohan gives a statement that, "A tissue is a group of similar cells performing similar functions". But Rajiv counter argues that, "this is true in case of simple tissues but little different in case of complex tissues". Provide your explanation in view of the discussion in class. [3]

15. The Figure shows jellyfish.

[4]



- (a) Name their animal group.
- (b) What type of symmetry is commonly associated with this group?
- (c) How many principal openings serve the digestive cavity?
- (d) State a limitation of that arrangement.

16. Give one defining feature and one role each of Meiosis and Lysosome. Also give one application or example of Meiosis.

[5]

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which entry is correctly associated with this feature: it can scatter visible light?

[1]

- | | |
|-----------------------|------------------|
| (i) Solvent | (ii) Decantation |
| (iii) Crystallisation | (iv) Colloid |

18. Which concept is most directly illustrated here? Ion formation does not alter this number.

[1]

- | | |
|-------------------|--------------------|
| (i) Thomson model | (ii) K shell |
| (iii) Isotopes | (iv) Atomic number |

19. Which entry is correctly associated with this feature: it is commonly present in the smaller amount in simple solutions?

[1]

- | | |
|-------------------------|---------------------|
| (i) Alloy | (ii) Solute |
| (iii) Separating funnel | (iv) Chromatography |

20. Which of the following mixtures are correctly classified as homogeneous (Hm) and heterogeneous (Ht)? Choose the correct option.

[1]

- (i) Air — Hm, Milk — Ht, Sugar solution — Hm, Smoke — Hm
- (ii) Brass — Ht, Fog — Ht, Vinegar — Ht, Muddy water — Hm
- (iii) Copper sulfate solution — Hm, Salt solution — Hm, Milk — Hm, Bronze — Hm
- (iv) Muddy water — Ht, Milk — Ht, Blood — Ht, Brass — Hm

21. Which concept is most directly illustrated here? It does not count orbital electrons. [1]

- | | |
|--------------------------|-------------------------------|
| (i) Dalton atomic theory | (ii) Electronic configuration |
| (iii) Mass number | (iv) Thomson model |

22. Which concept is most directly illustrated here? They normally have similar chemical properties because their electron arrangements match. [1]

- | | |
|--------------------------|---------------|
| (i) Neutron | (ii) K shell |
| (iii) Nucleus of an atom | (iv) Isotopes |

23. Which concept is most directly illustrated here? Their electron arrangements and chemical properties need not be the same. [1]

- | | |
|--------------------------|--------------|
| (i) Dalton atomic theory | (ii) K shell |
| (iii) Nucleus of an atom | (iv) Isobars |

24. Which electrons directly participate in chemical bonding and help determine the reactivity of an atom? [1]

- | | |
|---------------|------------------------|
| (i) Isotopes | (ii) Atomic number |
| (iii) Valency | (iv) Valence electrons |

25. A common talcum powder contains 4 % m/m zinc oxide, which acts as an antiseptic. How much zinc oxide is present in 300 g of the talcum powder? [2]

26. A. A reaction sketch shows two oxygen molecules producing only one oxygen atom, with no other oxygen-containing products. Identify the defect and state the rule the sketch must satisfy. State the law governing the total mass in this reaction. [3]

OR

B. For calcium hydroxide, $\text{Ca}(\text{OH})_2$, use relative atomic masses $\text{Ca} = 40$, $\text{O} = 16$, $\text{H} = 1$. Calculate the formula unit mass and the total mass of 7 formula units in u. Explain why formula unit is used here rather than an isolated molecule.

27. A. Choose the correct options, and explain the reason for the correct and incorrect options. Which among the following mixtures show the Tyndall Effect? A mixture of: (a) air and dust particles (b) copper sulfate and water (c) starch and water (d) acetone and water [3]

- | | |
|---------------|--------------|
| (i) a and b | (ii) b and d |
| (iii) a and c | (iv) c and d |

OR

B. For Simple distillation and Suspension, give one defining feature and one function or significance of each.

28. Which of the following statements are correct or incorrect according to the Bohr's atomic model? Give a reason for each statement.

(i) Electrons lose energy while moving in fixed orbits and slowly fall into the nucleus.

(ii) Electrons can exist anywhere around the nucleus with no fixed energy.

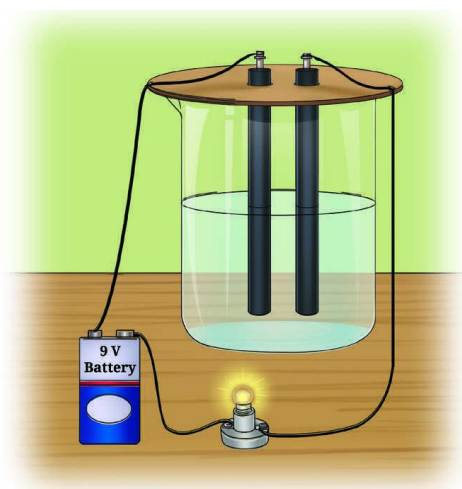
(iii) Electrons revolve around the nucleus in orbits of fixed energy without losing energy.

(iv) Electrons can be found between energy levels as they move around the nucleus.

[4]

29. A. The Figure shows a conductivity test with electrodes immersed in a solution.

[5]



(a) Which particles carry current in an ionic solution?

(b) Why may the corresponding ionic solid fail to conduct?

(c) What should be held constant when comparing two solutions?

(d) What does a glowing bulb show in this setup?

(e) Does a neutral overall solution mean that it contains no charged particles?

Explain.

OR

B. For potassium nitrate, KNO_3 , use relative atomic masses $\text{K} = 39$, $\text{N} = 14$, $\text{O} = 16$. Calculate the formula unit mass and the total mass of 7 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. For a body of fixed mass, which physical quantity must be non-zero for the body to accelerate?

[1]

(i) Balanced forces

(ii) Newton's third law

(iii) Net force

(iv) Newton's second law

31. Which of the following describes how velocity changes with time? [1]
(i) Acceleration (ii) Average speed
(iii) Distance (iv) Position–time graph

32. When sound travels from a tuning fork to your ear, which of the following actually reaches your ear? [1]
(i) Air particles near the tuning fork
(ii) Energy carried by sound waves
(iii) The tuning fork material
(iv) A continuous stream of compressed air

33. A. You have witnessed weather phenomena, such as winds, storms, rainfall, etc. Which atmospheric layer is mainly responsible for such phenomena and what is the primary reason for its occurrence? [2]

OR

B. Give one feature each of: Nitrogen fixation and Carbon cycle.

34. Varsha told her friend Meghna, “It will rain this afternoon because the clouds look dark”. Think of some questions Meghna could ask Varsha to make this prediction scientifically testable. [2]

35. A. Give one defining feature and one role each of Watt and Kinetic energy. Also give one application or example of Watt. [5]

OR

B. A frictional force of 28 N opposes a sledge over 5 m. Find the work done by friction and the corresponding decrease in kinetic energy if no other force does work. Distinguish joule from watt. State the law of energy conservation. Name one possible non-mechanical energy output in a real device.

36. A. Solar panels are shown in the Figure. [3]



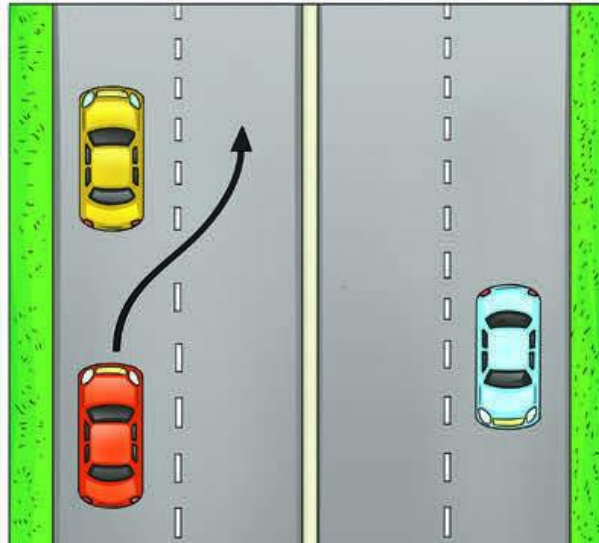
- (a) What is the original source of the energy they receive?
- (b) In what form does that energy reach Earth through space?
- (c) Why can this energy reach Earth despite the vacuum of space?

OR

B. For Valley breeze and Greenhouse effect, give one defining feature and one function or significance of each.

37. The Figure shows vehicles taking a turn.

[3]



- (a) Can a turning vehicle accelerate while its speed remains constant?
- (b) Which part of velocity changes on such a turn?
- (c) For a steady circular turn, in which direction is the acceleration?

38. An echo from a test wall returns after 2.3 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]

39. For Net force and Newton's third law, give one defining feature and one function or significance of each. [3]