

SCIENCE EXPLORATION

Sample Question Paper 15

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: a category grouping related orders? **[1]**
(i) Porifera (ii) Class
(iii) Angiosperms (iv) Cnidaria
2. Which of the following provides support and resists excessive swelling? **[1]**
(i) Cell membrane (ii) Leucoplast
(iii) Nucleus (iv) Cell wall
3. Which of the following allows a new plant to establish roots before separation? **[1]**
(i) Anther (ii) Zygote
(iii) Layering (iv) Pollen tube
4. Which of the following can rapidly multiply selected plants? **[1]**
(i) Tissue culture (ii) Style
(iii) Binary fission (iv) Ovum
5. Which of the following contributes yellow, orange or red colours to plant parts? **[1]**
(i) Chromoplast (ii) Mitosis
(iii) Meiosis (iv) Nucleus
6. Which of the following produces pollen grains? **[1]**
(i) Anther (ii) Grafting
(iii) Binary fission (iv) Style

7. Which of the following positions the anther for pollen release? [1]

- (i) Menstruation (ii) Pollen tube
(iii) Filament (iv) Binary fission

8. Identify the scientific term: preserved remains, impressions or traces of past life? [1]

- (i) Fossil (ii) Aves
(iii) Mollusca (iv) Amphibia

9. Identify the scientific term: a naming system using a genus name and a specific epithet? [1]

- (i) Echinodermata (ii) Mollusca
(iii) Nematoda (iv) Binomial nomenclature

10. A. A researcher identified a unicellular eukaryotic organism as fungi. What identification key would you suggest according to the five kingdom classification to keep a unicellular organism in the Kingdom Fungi? [2]

OR

B. State one defining feature of each of the following: Platyhelminthes and Animalia.

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

OR

B. State one defining feature of each of the following: White blood cell and Tendon.

12. What argument would you give for the necessity of a cell wall in plants usually fixed in one place versus in animals usually moving from one place to the other? [2]

13. The Figure is a micrograph of yeast with small outgrowths. [3]



- (a) Name the asexual process shown.
(b) How does the new individual begin?
(c) How does its genetic material arise?

14. A. The Figure shows mushrooms growing on organic material.

[3]



- (a) Name the kingdom.
- (b) How do they obtain nutrients?
- (c) Why are they not classified as green plants?

OR

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

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

A: A membrane sac containing digestive enzymes.

B: A membrane network without attached ribosomes.

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

[4]

16. Answer the following about Neuron and Lateral meristem:

- (a) State one defining feature and one role of Neuron.
- (b) State one defining feature and one role of Lateral meristem.
- (c) Give one application or example illustrating the significance of Neuron.

[5]

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which entry is correctly associated with this feature: they share the same atomic number?

[1]

(i) Electronic configuration

(ii) Isotopes

(iii) Thomson model

(iv) Dalton atomic theory

18. Which entry is correctly associated with this feature: it has a net charge for the whole group?

[1]

(i) Chemical formula

(ii) Compound

(iii) Polyatomic ion

(iv) Formula unit mass

19. At a Tiwari Academy science workshop, students discuss the following task. Which of the following has light-scattering dispersed particles that do not settle on standing? [1]

- | | |
|-----------------------|-------------------------|
| (i) Colloid | (ii) Solution |
| (iii) Crystallisation | (iv) Saturated solution |

20. Which of the following contributes the dissolved component? [1]

- | | |
|-------------------------|--------------------|
| (i) Homogeneous mixture | (ii) Solute |
| (iii) Solution | (iv) Sedimentation |

21. Which of the following forms the continuous medium of a solution? [1]

- | | |
|------------------------|----------------------|
| (i) Saturated solution | (ii) Crystallisation |
| (iii) Sedimentation | (iv) Solvent |

22. Which of the following is in equilibrium with any excess undissolved solute? [1]

- (i) Crystallisation
- (ii) Saturated solution
- (iii) Fractional distillation
- (iv) Tyndall effect

23. Which of the following expresses a saturation limit? [1]

- | | |
|------------------|---------------------|
| (i) Decantation | (ii) Chromatography |
| (iii) Solubility | (iv) Suspension |

24. Which of the following makes the beam's path visible in suitable dispersions? [1]

- (i) Evaporation
- (ii) Simple distillation
- (iii) Tyndall effect
- (iv) Chromatography

25. A neutral model atom in a particle-counting task contains 14 protons and 16 neutrons. Determine its atomic number and mass number. [2]

26. A. The species ^{27}Al , $^{80}\text{Br}^-$ and $^{201}\text{Hg}^{2+}$ have 13, 35 and 80 protons, respectively. How many electrons and neutrons do they have? [3]

OR

B. Explain why a closed bag swelling during a gas-producing reaction is compatible with unchanged total mass. State the law governing the total mass in this reaction.

27. The Figure shows a laboratory centrifuge.

[3]



- (a) What motion does the instrument use?
- (b) What difference between components enables separation?
- (c) Why can it be useful when ordinary settling is slow?

28. A. Choose the correct statement(s) and correct the false statement(s).

- (i) Elements are made up of molecules and compounds are made up of atoms.
- (ii) The molecule of a compound is always made up of two or more atoms of the same kind.
- (iii) One molecule of nitrogen gas contains three nitrogen atoms.
- (iv) Water is made of two hydrogen atoms, covalently bonded with one oxygen atom.

[4]

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 6 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.

29. A. Answer the following about Electronic configuration and Valence electrons:

- (a) State one defining feature and one role of Electronic configuration.
- (b) State one defining feature and one role of Valence electrons.
- (c) Give one application or example illustrating the significance of Electronic configuration.

[5]

OR

B. A neutral model atom in a particle-counting task contains 15 protons and 17 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.

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Identify the scientific term: night-time coastal airflow from cooler land towards relatively warmer sea? [1]

(i) Deforestation

(ii) Albedo

(iii) Mountain breeze

(iv) Land breeze

31. Using a horizontal force F , a table is moved across the floor at a constant velocity. How much is the frictional force exerted by the floor on the table? [1]

32. Identify the scientific term: total distance divided by total elapsed time? [1]

(i) Uniform acceleration

(ii) Distance

(iii) Average speed

(iv) Velocity–time graph

33. Explain how mathematics helps science beyond merely obtaining a numerical answer. Give two uses. [2]

34. A. In a room, the reflected sound reaches the ear 0.05 s after its production. Will it produce an echo or reverberation? Justify your answer. [2]

OR

B. During a thunderstorm, lightning is seen before thunder is heard because sound travels much slower than light. If the time delay between seeing the lightning flash and hearing the thunder is measured to be 5 s, estimate the distance to the lightning strike. Use the speed of sound in air as 340 m s^{-1} . Assume that light (speed = 300000 km s^{-1}) reaches you almost instantaneously.

35. An ace footballer converted a penalty shot by kicking the football with a speed of 108 km h^{-1} . The estimated force they imparted was 800 N. The mass of the football was 0.4 kg. Calculate the time of contact between their foot and the ball. [3]

36. A. Suppose a car is moving on a highway and brakes are applied, which cause an acceleration of -4 m s^{-2} . How much will be the distance travelled by the car before coming to a stop, if the car was moving with a velocity of (i) 54 km h^{-1} , and (ii) 108 km h^{-1} when the brakes were applied? [3]

OR

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

37. A. Study the electric bell inside the bell jar.

[3]



- (a) What happens to the heard sound as air is removed while the bell continues vibrating?
- (b) What remains visible although the sound weakens?
- (c) What conclusion is supported by this experiment?

OR

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

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

A: Warming associated with atmospheric absorption and re-emission of outgoing thermal radiation.

B: Cooler air flowing downslope at night.

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

[4]

39. Observe the stretched slingshot in the Figure.

[5]



- (a) What energy store is increased by stretching its band?
- (b) Where does this stored energy come from?
- (c) Which energy form does the projectile gain on release?
- (d) If 8 J is stored and 6 J reaches the projectile, how much is transferred elsewhere?
- (e) Name one destination of that remaining energy.