# SAMPLE PAPER 9

## SCIENCE - CLASS IX

**Exploration | Session 2026-27**

**Maximum Marks: 80** **Time Allowed: 3 Hours**

**General Instructions**

1. This question paper consists of 39 questions in five sections.
2. All questions are compulsory. Internal choice is provided in some questions; attempt only one alternative.
3. Section A contains 20 objective-type questions of 1 mark each.
4. Section B contains 6 Very Short Answer questions of 2 marks each.
5. Section C contains 7 Short Answer questions of 3 marks each.
6. Section D contains 3 Long Answer questions of 5 marks each.
7. Section E contains 3 case-based/data-based questions of 4 marks each.
8. Draw neat labelled diagrams wherever required and show complete working in numerical questions.

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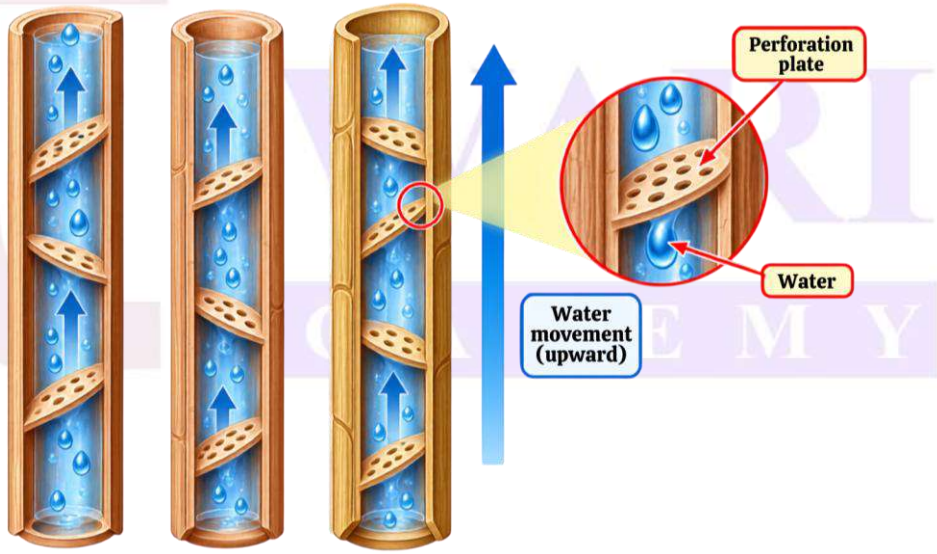
### Section A (1 Mark Each)

*(Questions 1-16 are multiple-choice questions. Questions 17-20 are Assertion-Reason questions.)*

**1.** Which practice is most important while testing a scientific explanation?
(a) Relying only on opinion
(b) Recording observations systematically
(c) Changing the question after every observation
(d) Avoiding repeated trials

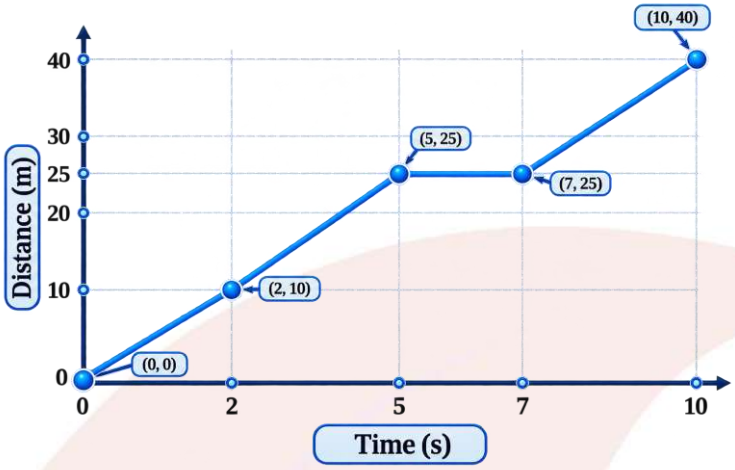
**2.** Which organelle forms a network of membranes involved in transport of materials within a cell?
(a) Endoplasmic reticulum (b) Cell wall
(c) Nucleolus (d) Centrosome

**3.** The tissue shown in the figure mainly transports:



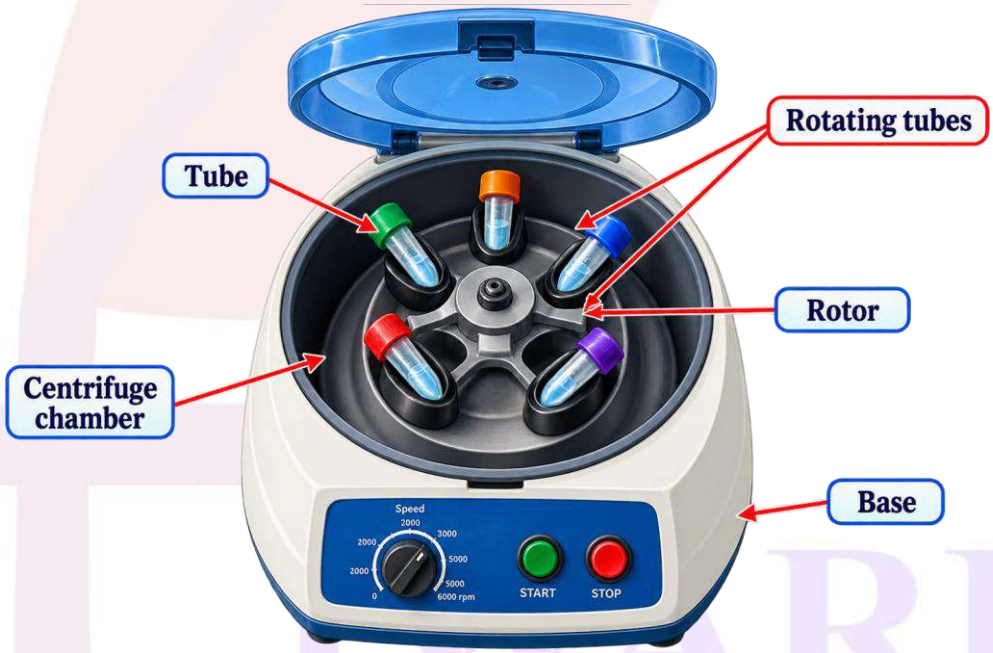

(a) food from leaves (b) water and minerals upward in plants
(c) nerve impulses (d) oxygen in animals

**4.** Study the distance-time graph. During which interval is the object at rest?




(a) 0-2 s (b) 2-5 s (c) 5-7 s (d) 7-10 s

**5.** The device shown separates components by rapid spinning. It is commonly used for:

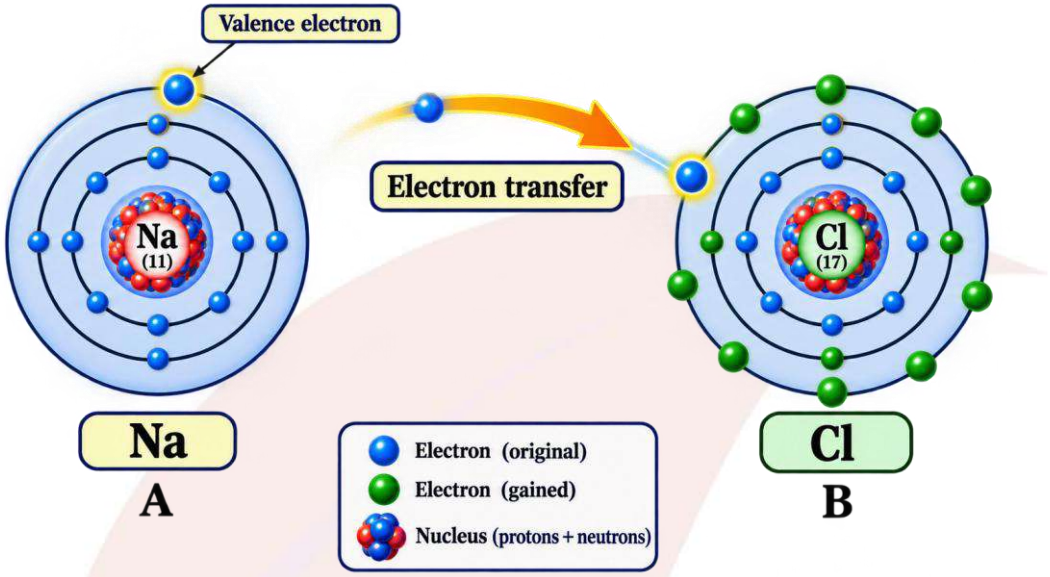



(a) separating cream from milk
(b) separating salt from water by evaporation
(c) separating iron from sand
(d) separating oil and water with a funnel

**6.** A 6 kg body accelerates from rest at 4 m $s^{-2}$. The net force acting on it is:
(a) 1.5 N (b) 10 N (c) 24 N (d) 30 N

**7.** A machine gives a mechanical advantage of 5 when an effort of 80 N is applied. The load is:
(a) 16 N (b) 85 N (c) 400 N (d) 800 N

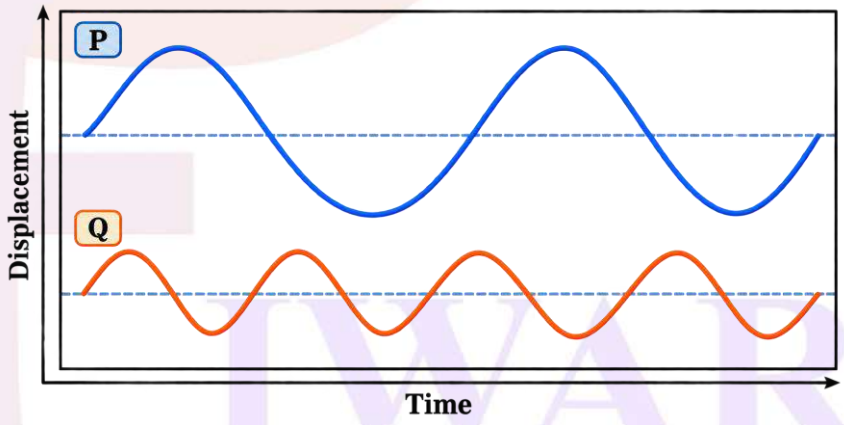
**8.** In the electron-transfer diagram, atom A loses an electron and atom B gains it. The bond formed is:




(a) covalent (b) ionic (c) metallic (d) hydrogen

**9.** An atom contains 11 protons, 12 neutrons and 11 electrons. Its mass number is:
(a) 11 (b) 12 (c) 22 (d) 23

**10.** Study sound waves P and Q. Which statement is correct?




(a) P has greater amplitude and Q has greater frequency
(b) P has greater frequency only
(c) Q has greater amplitude
(d) Both have identical amplitude and frequency

**11.** Which event occurs immediately after fertilisation in sexual reproduction?
(a) Formation of a zygote
(b) Pollination
(c) Formation of pollen grains
(d) Germination

**12.** Which group is correctly matched with its characteristic?
(a) Mammalia - feathers
(b) Aves - mammary glands
(c) Amphibia - life associated with water and land
(d) Pisces - lungs only

**13.** Which activity increases atmospheric carbon dioxide most directly?
(a) Photosynthesis
(b) Burning fossil fuels
(c) Nitrogen fixation
(d) Condensation

**14.** Which structure controls exchange of gases in leaves?
(a) Stomata
(b) Xylem vessels
(c) Root hairs
(d) Pollen grains

**15.** A person walks 15 m east and then 8 m west. The displacement is:
(a) 23 m east
(b) 7 m east
(c) 7 m west
(d) 23 m west

**16.** Which method is most suitable for separating two miscible liquids with sufficiently different boiling points?
(a) Distillation
(b) Filtration
(c) Sedimentation
(d) Magnetic separation

**For Questions 17-20, choose:**
**(a) Both A and R are true and R correctly explains A;**
**(b) Both A and R are true but R does not explain A;**
**(c) A is true but R is false;**
**(d) A is false but R is true.**

**17.** Assertion (A): A horizontal line on a distance-time graph indicates that an object is at rest.
Reason (R): Its distance from the reference point does not change with time.

**18.** Assertion (A): The mechanical advantage of a machine may be greater than one.
Reason (R): A machine can allow a smaller effort to overcome a larger load.

**19.** Assertion (A): Isotopes have different mass numbers.
Reason (R): Isotopes of the same element contain different numbers of neutrons.

**20.** Assertion (A): A chlorine atom tends to gain one electron while forming chloride ion.
Reason (R): Chlorine has seven electrons in its outermost shell.

## Section B (2 Mark Each)

*(Questions 21-26 are Very Short Answer questions.)*

**21.** Why does the smell of perfume spread throughout a room even without stirring? Name the process involved.

**22.** A cyclist covers 90 m in 6 s and then 210 m in 14 s. Calculate the average speed for the entire journey.

**23.** What is centrifugation? Give one everyday or laboratory application of this method.

**24.** A 5 kg object changes its velocity from 2 m $s^{-1}$ to 12 m $s^{-1}$ in 5 s. Calculate its acceleration and net force.

**25.** A machine performs 720 J of useful work for an input of 900 J. Calculate its efficiency and the energy dissipated.

**26.** An atom has atomic number 14 and mass number 28. Find the number of protons, neutrons and electrons in the neutral atom.

## Section C (3 Mark Each)

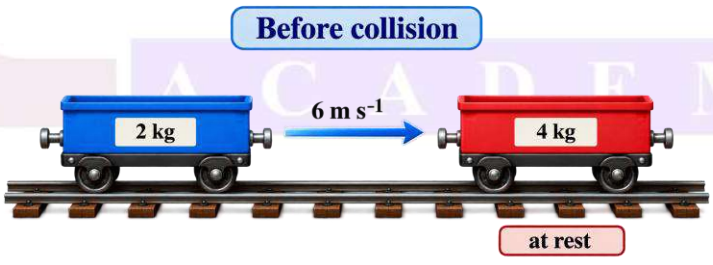
*(Questions 27-33 are Short Answer questions.)*

**27.** Explain the functions of xylem, phloem and stomata in a plant. How do these structures together support transport and exchange with the environment?

**28.** A scooter moving at 12 m $s^{-1}$ accelerates uniformly at 3 m $s^{-2}$ for 4 s. Calculate its final velocity and displacement during this time.

**29.** A mixture contains sand, common salt and naphthalene. Describe a suitable sequence of methods to separate all three components.

**30.** Study the collision situation shown. The 2 kg trolley moves at 6 m $s^{-1}$ towards a 4 kg trolley at rest.




(a) Calculate the initial momentum of the 2 kg trolley.
(b) Calculate the initial momentum of the 4 kg trolley.
(c) State the total momentum of the system before collision.

**31.** A machine lifts a 450 N load with an effort of 150 N. Calculate its mechanical advantage. If its velocity ratio is 4, calculate its efficiency and explain why the value is less than 100%.

**32.** Elements X and Y have electronic configurations 2,8,2 and 2,8,7 respectively. State their valencies and explain the formation and formula of the compound between them.

**33.** A tuning fork makes 1020 vibrations in 3 s. Calculate its frequency. If sound travels at 340 m $s^{-1}$, calculate its wavelength and state what determines its pitch.

## Section D (5 Mark Each)

*(Questions 34-36 are Long Answer questions. Internal choice is provided.)*

**34.**

(a) Explain the structure and functions of xylem and phloem.

(b) Compare parenchyma and sclerenchyma with respect to cell structure and function.

**OR**

(a) Describe epithelial, connective and nervous tissues with suitable functions.

(b) Differentiate between tendon and ligament.

**35.**

(a) Explain reproduction in flowering plants from pollination to seed formation.

(b) Distinguish between self-pollination and cross-pollination.

**OR**

(a) Explain binary fission, budding and vegetative propagation with one example each.

(b) Give two reasons why sexual reproduction produces greater variation.

**36.**

(a) State the main characteristics of Bryophyta, Pteridophyta, Gymnosperms and Angiosperms.

(b) Give one example of each.

**OR**

(a) Explain the distinguishing features of Pisces, Amphibia, Reptilia, Aves and Mammalia.

(b) Give one example of each group.

## Section E (4 Mark Each)

*(Questions 37-39 are case-based/data-based questions with sub-parts.)*

**37.** A 15 kg cart is initially moving at 3 m $s^{-1}$. A constant net force of 30 N acts in the direction of motion for 4 s.

(a) Calculate the acceleration of the cart.

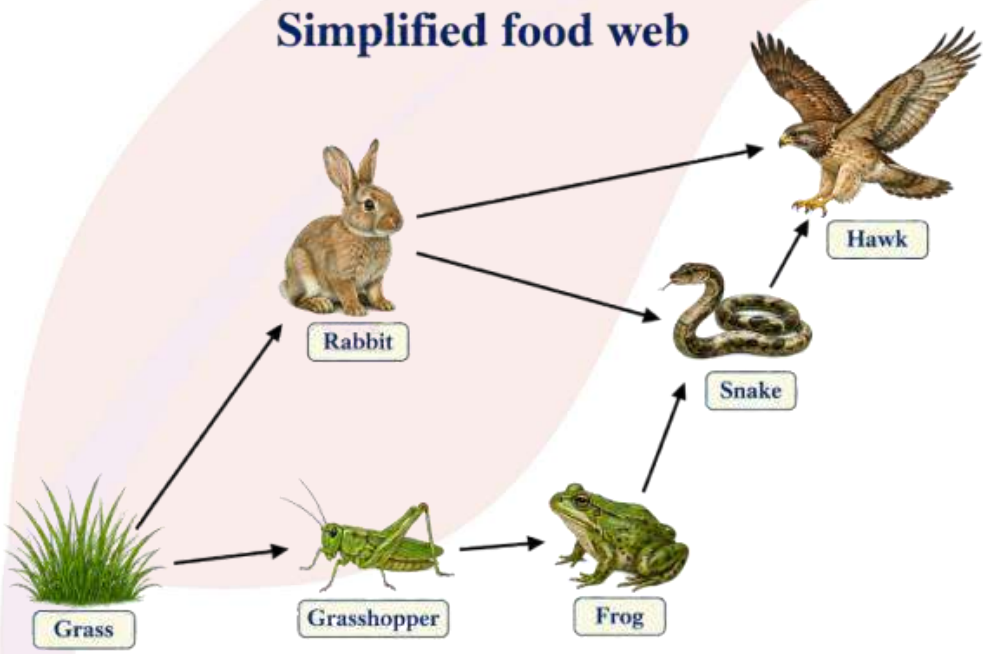
(b) Calculate its final velocity.

(c) Calculate its initial momentum.

(d) Calculate its final momentum.

**38.** A gardener notices that strawberry plants produce new plants through horizontal stems, while flowering plants in the same garden produce seeds after fertilisation.
(a) Name the horizontal stem used in vegetative propagation.
(b) Is this reproduction sexual or asexual?
(c) What is formed immediately after fusion of male and female gametes?
(d) Which method is expected to produce more genetic variation, and why?

**39.** Study the simplified food web shown below. Arrows indicate the direction of transfer of food energy.




(a) Name one producer in the food web.
(b) Name one primary consumer.
(c) Write one food chain containing four organisms from the diagram.
(d) Predict one likely effect on the grasshopper population if the frog population decreases greatly.