

SAMPLE PAPER 5

SCIENCE - CLASS IX

Exploration | Session 2026-27

Maximum Marks: 80

Time Allowed: 3 Hours

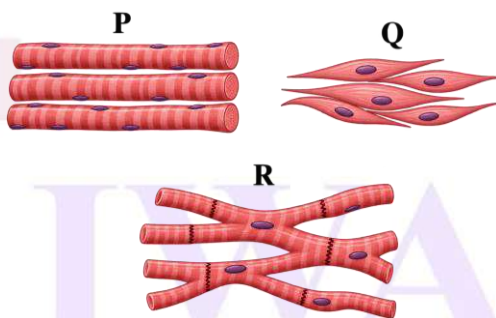
General Instructions

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.
- 9.

Section A (1 Mark Each)

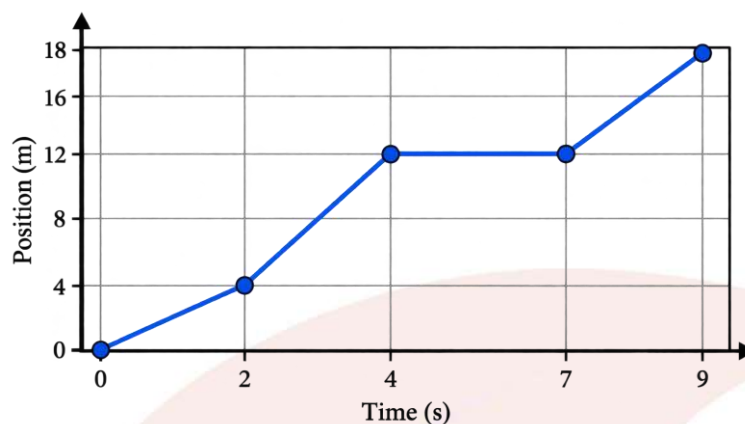
(Questions 1-16 are multiple-choice questions. Questions 17-20 are Assertion-Reason questions.)

1. A good scientific model is most useful when it:
(a) includes every possible detail
(b) helps explain observations and make testable predictions
(c) never changes
(d) avoids assumptions completely
2. Which structure is responsible for photosynthesis in a green plant cell?
(a) Chloroplast (b) Lysosome (c) Ribosome (d) Nucleus
3. Study the three muscle tissues shown. Which labelled tissue represents smooth muscle?



- (a) P (b) Q (c) R (d) P and R
4. If a net force of 24 N acts on an 8 kg object, its acceleration is:
(a) 2 m s^{-2} (b) 3 m s^{-2} (c) 16 m s^{-2} (d) 192 m s^{-2}
 5. Which characteristic of a sound wave determines its loudness?
(a) Frequency
(b) Amplitude
(c) Wavelength only
(d) Speed

6. Study the position-time graph. During which interval is the object at rest?



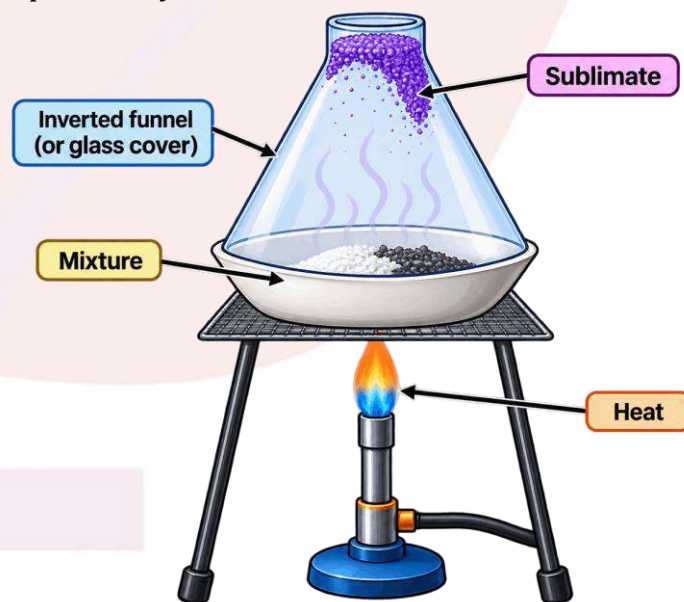
(a) 0-2 s

(b) 2-4 s

(c) 4-7 s

(d) 7-9 s

7. The apparatus shown is used to separate a sublimable solid from a non-sublimable substance. Which mixture can be separated by this method?



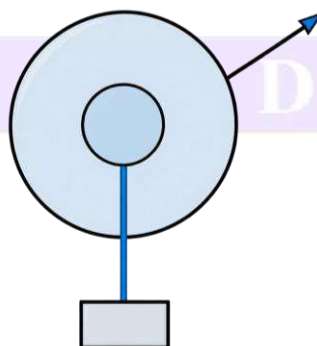
(a) Ammonium chloride and sand

(b) Salt and water

(c) Oil and water

(d) Iron filings and sulphur

8. The simple machine shown is a:



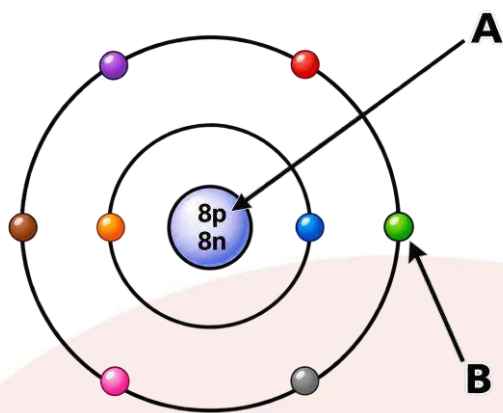
(a) pulley

(b) wheel and axle

(c) lever

(d) wedge

9. Study the atom shown. Which element is represented if the nucleus contains 8 protons?

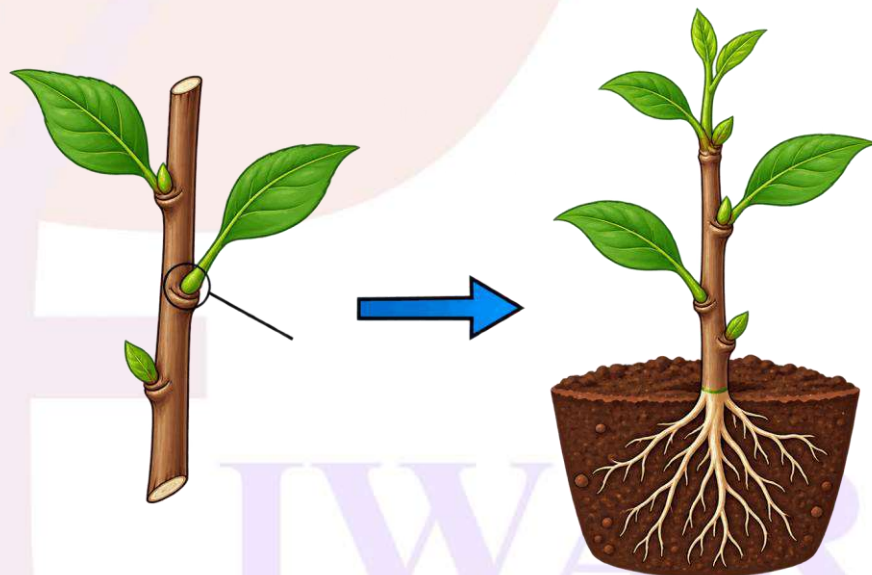


- (a) Carbon (b) Nitrogen (c) Oxygen (d) Neon

10. Which of the following is most likely an ionic compound?

- (a) CO_2 (b) NH_3 (c) KCl (d) CH_4

11. The figure represents reproduction using a stem cutting. This is an example of:



- (a) sexual reproduction
(b) vegetative propagation
(c) binary fission
(d) spore formation

12. Which group of plants has vascular tissue but does not form seeds?

- (a) Bryophyta
(b) Pteridophyta
(c) Gymnosperms
(d) Angiosperms

13. Which gas is a greenhouse gas?

- (a) Carbon dioxide
- (c) Neon

- (b) Helium
- (d) Hydrogen

14. Which organelle helps package and transport proteins within or out of a cell?

- (a) Golgi apparatus
- (c) Chromosome

- (b) Cell wall
- (d) Vacuole only

15. An object moves 10 m east and then 6 m west. Its displacement is:

- (a) 16 m east
- (c) 4 m west

- (b) 4 m east
- (d) 16 m west

16. Which technique is most suitable for separating cream from milk?

- (a) Centrifugation
- (c) Crystallisation

- (b) Sublimation
- (d) Chromatography

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 body moving at constant speed along a straight line has zero acceleration.
Reason (R): Its velocity remains constant.

18. Assertion (A): A wheel and axle can multiply force.
Reason (R): The wheel and axle have different radii, producing different turning effects.

19. Assertion (A): The atomic number uniquely identifies an element.
Reason (R): Atomic number equals the number of protons in the nucleus.

20. Assertion (A): Sodium chloride has a high melting point.
Reason (R): Strong electrostatic attraction exists between oppositely charged ions.

Section B (2 Mark Each)

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

21. Why does a plant cell become turgid when placed in a dilute solution? Name the process involved.

22. A student walks 100 m east in 20 s and then 60 m west in 10 s. Calculate the total distance and average speed.

23. Differentiate between a colloid and a suspension on the basis of settling of particles and filtration.

24. A 1500 kg car accelerates at 2 m s^{-2} . Calculate the net force acting on it. What happens to the acceleration if the net force is doubled while mass remains unchanged?

25. A 200 N load is raised through 4 m in 5 s. Calculate the work done and power developed.

26. An atom has atomic number 20 and mass number 40. Find its numbers of protons, electrons and neutrons.

Section C (3 Marks Each)

(Questions 27-33 are Short Answer questions.)

27. Explain the structure and functions of the cell wall, chloroplast and mitochondrion. Which two of these are absent from a typical animal cell?

28. A bicycle increases its velocity uniformly from 5 m s^{-1} to 17 m s^{-1} in 6 s. Calculate its acceleration and displacement during this time.

29. A mixture contains iodine, common salt and sand. Describe a suitable sequence of separation methods to obtain the three substances separately.

30. A 2 kg object moving at 10 m s^{-1} is acted upon by a force opposite to its motion and comes to rest in 5 s. Calculate its acceleration and force.

31. A machine has mechanical advantage 3 and velocity ratio 4. Calculate its efficiency. Explain why no real machine can normally have efficiency greater than 100%.

32. Element A has electronic configuration 2,8,3 and element B has electronic configuration 2,6. State their valencies and explain how the formula of the compound formed between them can be obtained.

33. A sound source produces 900 vibrations in 3 s. Calculate its frequency and time period. If the wavelength is 1.1 m, calculate the speed of the sound wave.

Section D (5 Marks Each)

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

34.

(a) Compare meristematic and permanent tissues with respect to cell division, cell structure and function.

(b) Explain the functions of xylem and phloem.

OR

(a) Describe epithelial, connective and muscular tissues with suitable examples.

(b) Explain why cardiac muscle is adapted for continuous rhythmic contraction.

35.

(a) Explain vegetative propagation using stem, root or leaf with suitable examples.

(b) State two advantages and one limitation of asexual reproduction.

OR

- (a) Explain pollination, fertilisation and seed formation in flowering plants.
(b) Distinguish between internal and external fertilisation with examples.

36.

- (a) Explain the main characteristics of the five kingdoms: Monera, Protista, Fungi, Plantae and Animalia.
(b) State the importance of binomial nomenclature.

OR

- (a) Explain the distinguishing characteristics of Arthropoda, Mollusca, Echinodermata and Chordata with one example each.
(b) Why are classification systems useful for studying biodiversity?

Section E (4 Marks Each)

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

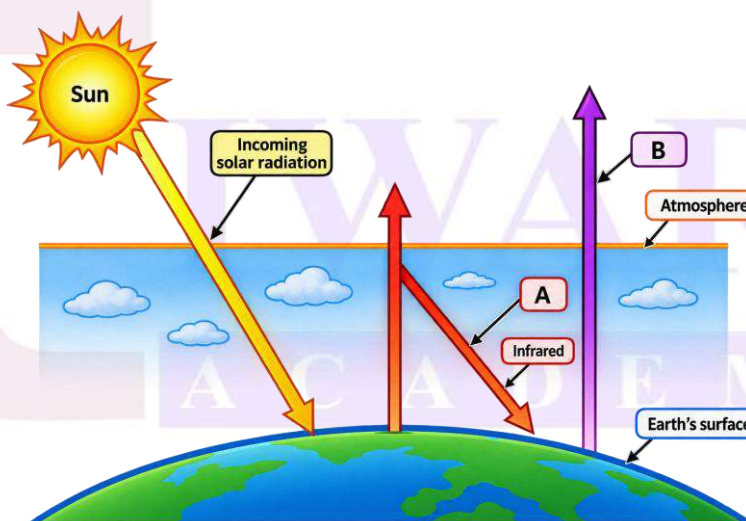
37. A 6 kg trolley moving at 2 m s^{-1} is acted upon by a constant net force of 12 N in the direction of motion for 5 s.

- (a) Calculate its acceleration.
(b) Calculate its final velocity.
(c) Calculate its initial momentum.
(d) Calculate its final momentum.

38. A gardener takes a healthy stem cutting from a parent plant and plants it in moist soil. After some days, roots develop and a new plant begins to grow.

- (a) Name the method of reproduction.
(b) Is this method sexual or asexual?
(c) Why is the new plant expected to be very similar to the parent plant?
(d) State one practical advantage of this method in agriculture or horticulture.

39. Study the simplified greenhouse-effect diagram.



- (a) What happens to much of the incoming solar radiation after it reaches the Earth's surface?
(b) What does arrow A represent?
(c) What does arrow B represent?
(d) Explain how an increase in greenhouse gases can raise the Earth's average temperature.