

SCIENCE EXPLORATION

Sample Question Paper 19

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 entry is correctly associated with this feature: it has surface ribosomes? [1]
(i) Prokaryotic cell
(ii) Rough endoplasmic reticulum
(iii) Ribosome
(iv) Nucleus
2. Which of the following carries the male gametes towards the ovule? [1]
(i) Sepal (ii) Condom
(iii) Ovum (iv) Pollen tube
3. Which kingdom contains multicellular organisms that lack cell walls and usually obtain food by ingestion? [1]
(i) Monera (ii) Protista
(iii) Fungi (iv) Animalia
4. Which of the following forms a zygote and restores the diploid chromosome number? [1]
(i) Petal (ii) Tissue culture
(iii) Style (iv) Fertilisation
5. Which of the following includes the algae in the textbook plant grouping? [1]
(i) Thallophytes
(ii) Gymnosperms
(iii) Bryophytes
(iv) Angiosperms

6. Which plant group includes mosses, lacks vascular tissue and commonly grows in moist places? [1]
(i) Pteridophytes (ii) Gymnosperms
(iii) Thallophytes (iv) Bryophytes
7. Which of the following produces sperm and male sex hormones? [1]
(i) Testis (ii) Puberty
(iii) Uterus (iv) Menstruation
8. Which of the following carries a haploid set of chromosomes to the egg? [1]
(i) Pollen tube (ii) Sperm
(iii) Menstruation (iv) Uterus
9. Which of the following contributes a haploid set of chromosomes and cytoplasm to the zygote? [1]
(i) Stigma (ii) Petal
(iii) Ovum (iv) Ovule
10. A. An earthworm (annelida) and a beetle (arthropoda), both have segmented bodies but the beetle has a hard external skeleton. How does the beetle's external skeleton help it survive? [2]

OR

B. Give one feature each of: Angiosperms and Echinodermata.

11. Once water is absorbed by plant roots, it has to travel against gravity through xylem. How do the 'dead' cells of the xylem work together with the living cells of leaves at the top to keep the water moving? [2]
12. Give one feature each of: Meiosis and Chromoplast. [2]
13. The Figure shows a dandelion seed head. [3]



- (a) Which dispersal agent is suggested by the light hairy structures?
(b) How do these structures help dispersal?
(c) Why is dispersal away from the parent useful?

14. The Figure shows a sponge.

[3]



(a) Name its animal phylum.

(b) What feature of its body gives the group its name?

(c) How does water movement help it feed?

15. A. Mitochondria and chloroplasts are two important organelles in a plant cell. Discuss how these two organelles are structurally and functionally similar to each other, and different from each other.

[4]

OR

B. Identify the two entries described below.

A: One nuclear division that usually produces two genetically similar daughter cells.

B: A membrane sac containing digestive enzymes.

For each, state its function or significance and a relevant feature.

16. A. Give one defining feature and one role each of Cardiac muscle and Bone. Also give one application or example of Cardiac muscle.

[5]

OR

B. Give one defining feature and one role each of Aerenchyma and Cartilage. Also give one application or example of Aerenchyma.

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which entry is correctly associated with this feature: it must account for the correct total electron number?

[1]

(i) Isobars

(ii) Mass number

(iii) Nucleus of an atom

(iv) Electronic configuration

18. Which entry is correctly associated with this feature: it initially treated atoms as indivisible?

[1]

(i) Atomic number

(ii) Mass number

(iii) Thomson model

(iv) Dalton atomic theory

19. Which subatomic particle is removed when a neutral atom becomes a positive ion? [1]
(i) Proton (ii) Electron
(iii) Thomson model (iv) Electronic configuration
20. Which entry is correctly associated with this feature: it can have different properties in different portions? [1]
(i) Heterogeneous mixture (ii) Chromatography
(iii) Solution (iv) Sublimation
21. Which concept is most directly illustrated here? Changing its number changes the identity of the element. [1]
(i) K shell (ii) Proton
(iii) Valence electrons (iv) Electron
22. Which concept is most directly illustrated here? Changing its number while retaining proton number produces an isotope. [1]
(i) Neutron (ii) Electron
(iii) Rutherford model (iv) Alpha particle
23. Which entry is correctly associated with this feature: it does not scatter a visible beam by the Tyndall effect? [1]
(i) Chromatography (ii) Solution
(iii) Sedimentation (iv) Heterogeneous mixture
24. Which entry is correctly associated with this feature: it can commonly be separated by ordinary filtration? [1]
(i) Crystallisation (ii) Suspension
(iii) Chromatography (iv) Fractional distillation
25. The atomic number of fluorine is 9. Explain the formation of the fluorine molecule (F_2). [2]
26. A. Write the chemical formulae for the following compounds. (i) Aluminium nitrate (ii) Calcium oxide (iii) Ferric oxide [3]
- OR**
- B. In a sealed reaction experiment, water droplets appear on the inner wall. Should the droplets be excluded from the final mass because they are outside the main reaction liquid? Explain. State the law governing the total mass in this reaction.
27. A. For L shell and Rutherford model, give one defining feature and one function or significance of each. [3]

OR

B. A neutral model atom in a particle-counting task contains 15 protons and 18 neutrons. Determine its atomic number and mass number. How many electrons does it contain?

28. A. The Figure shows gas from a reaction retained by a balloon on the flask. [4]



- (a) Why is the gas retained during a mass-conservation test?
- (b) How should total mass before and after the reaction compare?
- (c) Why can a similar open flask appear to lose mass?
- (d) Has missing mass been destroyed if the gas escapes?

OR

B. For aluminium oxide, Al_2O_3 , use relative atomic masses $\text{Al} = 27$, $\text{O} = 16$. 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.

29. Give one defining feature and one role each of Sublimation and Fractional distillation. Also give one application or example of Sublimation. [5]

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Which of the following describes directed motion? [1]

- | | |
|-----------------------|---------------|
| (i) Average speed | (ii) Distance |
| (iii) Reference frame | (iv) Velocity |

31. Name the term: the SI unit of power? [1]

- | | |
|--------------------------------|--------------------|
| (i) Work | (ii) Negative work |
| (iii) Elastic potential energy | (iv) Watt |

32. Name the term: constant total momentum of a system with no net external force? [1]

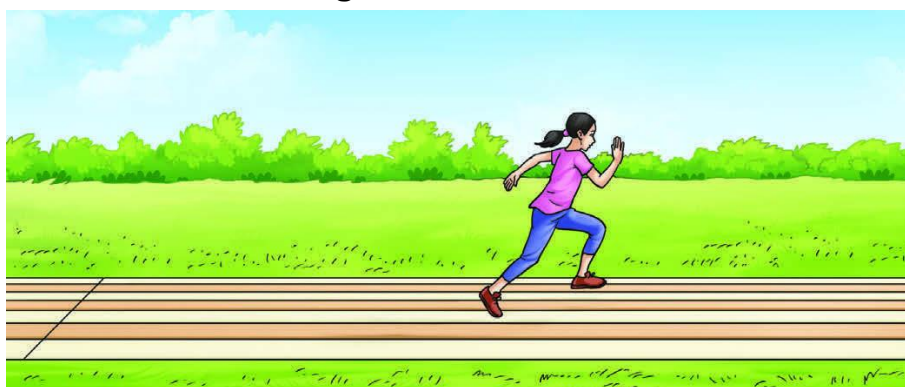
- (i) Conservation of momentum (ii) Momentum
(iii) Net force (iv) Inertia

33. If there are 10 density oscillations in 2 seconds at a given position, then calculate the (i) frequency of sound wave, and (ii) its time period. [2]

34. A car is represented by one point on a motion diagram. State what the model preserves and what it cannot show. [2]

35. A Tiwari Academy practice worksheet presents this problem. For Newton's first law and Action–reaction pair, give one defining feature and one function or significance of each. [3]

36. A. Observe the runner in the Figure. [3]



- (a) Which two measurements are required to calculate average speed?
(b) The runner covers 200 m in 25 s. Find the average speed.
(c) Does this average prove that the runner maintained the same speed throughout?

OR

B. For Velocity and Reference frame, give one defining feature and one function or significance of each.

37. A. The speed of sound in air is about 331 m s^{-1} at 0°C and nearly 344 m s^{-1} at 22°C . Roughly how much extra time will the sound of thunder take to travel a distance of 1720 m, if the air temperature changes from 22°C to 0°C ? Assume that all other conditions remain unchanged. [3]

OR

B. A vibrating source makes 540 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?

38. A. A coconut of mass 1.5 kg falls from the top of a coconut tree onto the wet sand on a beach. The height of the tree is 10 m. On impact, the coconut comes to rest by making a depression in the sand.

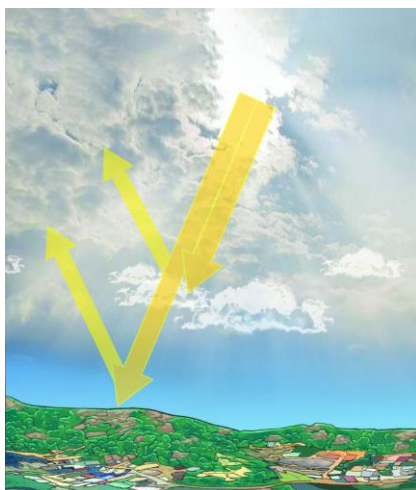
(i) Calculate the velocity of the coconut just before it hits the sand.

(ii) Assume that the average resistive force of sand is 3000 N and all of the coconut's energy is used to create the depression in the sand. Calculate the depth of the depression the coconut makes in the sand. Assume $g = 10 \text{ m s}^{-2}$. [4]

OR

B. A 27 kg wheeled model moves at 4 m s^{-1} . Calculate its kinetic energy and the kinetic energy it would have at 8 m s^{-1} . Distinguish joule from watt. State the law of energy conservation.

39. The Figure illustrates sunlight encountering different Earth surfaces. [5]



(a) What term describes the proportion of incident radiation reflected by a surface?

(b) Which usually reflects more sunlight: clean snow or a dark surface?

(c) What happens to absorbed solar energy when reflection decreases, other factors being equal?

(d) How can melting reflective ice reinforce warming?

(e) Why should reflected sunlight not be confused with absorbed energy?