

Full Practice Exam — Set 2

Science · Class 9 · Full Syllabus Practice Exam

TIME 60 minutes	QUESTIONS 50	TOTAL MARKS 60	MAX. SCORE ___ / 60
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Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

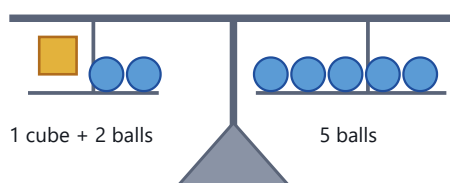
- There are **50 questions** in this paper. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–45 carry **1 mark** each. Questions 46–50 (Achievers Section) carry **3 marks** each.
- Take $g = 10 \text{ m/s}^2$ unless stated otherwise. There is no negative marking.
- Study every diagram and table carefully before answering.

Section 1 — Logical Reasoning

Q1–Q10 · 1 mark each

- What comes next in the series? 3, 9, 27, 81, ____
 (A) 162 (B) 216
 (C) 243 (D) 324
- What comes next in the series? ZA, YB, XC, ____
 (A) XD (B) WE
 (C) VD (D) WD
- If PEN is coded as 35, using the positions of the letters in the alphabet, then CUP is coded as _____.
 (A) 38 (B) 40
 (C) 42 (D) 44
- Find the **odd one out**: wheat, rice, maize, mango
 (A) Wheat (B) Rice
 (C) Maize (D) Mango
- Complete the analogy: Thermometer : Temperature :: Barometer : ____
 (A) Humidity (B) Atmospheric pressure
 (C) Wind speed (D) Rainfall
- A cyclist rides 3 km north and then 4 km east. How far is he from his starting point?
 (A) 1 km (B) 12 km
 (C) 7 km (D) 5 km
- If today is Wednesday, what day will it be after 62 days?
 (A) Tuesday (B) Monday
 (C) Thursday (D) Friday

8. Introducing a man, a woman said, "His wife is the only daughter of my father." How is the man related to the woman?
- (A) Brother (B) Husband
(C) Father (D) Uncle
9. Five friends sit in a row. P is to the left of Q but to the right of R. S is to the right of Q, and T is to the left of R. Who is sitting in the middle?
- (A) P (B) Q
(C) R (D) S
10. In the balance shown, one cube together with two balls exactly balances five balls. How many balls balance one cube?



A balance holding one cube and two balls against five balls

- (A) 2 (B) 3
(C) 4 (D) 5

Section 2 — Science

Q11–Q35 · 1 mark each

11. Which of the following substances sublimates on heating?
- (A) Common salt (B) Copper
(C) Sugar (D) Camphor
12. A burn caused by steam at 100 °C is more severe than one caused by water at 100 °C because steam _____.
- (A) Carries extra latent heat of vaporisation (B) Is hotter than boiling water
(C) Moves faster than water (D) Contains more oxygen
13. In a sugar solution, the solvent is _____.
- (A) Sugar (B) Water
(C) The mixture as a whole (D) Air dissolved in the water
14. The solubility of most solids in water _____ as the temperature rises.
- (A) Stays unchanged (B) Decreases
(C) Increases (D) Becomes zero
15. The rusting of iron is a _____.
- (A) Physical change (B) Reversible physical change
(C) Change of state (D) Chemical change
16. The chemical symbol of iron is _____.
- (A) Fe (B) In
(C) Ir (D) I

17. The atomicity of ozone (O_3) is _____.
(A) 1 (B) 2
(C) 3 (D) 6
18. The electron was discovered by _____.
(A) Rutherford (B) J. J. Thomson
(C) Neils Bohr (D) James Chadwick
19. The chemical formula of sodium sulphate is _____.
(A) $NaSO_4$ (B) $Na_2(SO_4)_3$
(C) Na_2SO_4 (D) Na_3SO_4
20. A bacterial cell is described as prokaryotic because it _____.
(A) Has no cell wall (B) Cannot reproduce
(C) Has no genetic material (D) Has no well-defined nucleus bounded by a membrane
21. The tiny pores on the surface of a leaf through which gases are exchanged are called _____.
(A) Stomata (B) Lenticels
(C) Root hairs (D) Cuticle
22. Striated (skeletal) muscles are described as voluntary because they _____.
(A) Never get tired (B) Work under our conscious control
(C) Are found in the heart (D) Contract only during sleep
23. The tissue that covers and lines the surfaces of the body and its organs is _____.
(A) Muscular tissue (B) Connective tissue
(C) Epithelial tissue (D) Nervous tissue
24. In the scientific name *Mangifera indica*, the word *Mangifera* denotes the _____.
(A) Species (B) Order
(C) Family (D) Genus
25. Animals of the phylum Porifera are commonly known as _____.
(A) Sponges (B) Jellyfish
(C) Flatworms (D) Starfish
26. Which of the following is a **scalar** quantity?
(A) Displacement (B) Distance
(C) Velocity (D) Acceleration
27. In the absence of air resistance, a coin and a feather dropped from the same height would _____.
(A) Have the feather land earlier (B) Have the coin land much earlier
(C) Reach the ground at the same time (D) Both remain suspended
28. A swimmer moves forward by pushing the water backwards. This is an example of _____.
(A) Newton's first law (B) Newton's second law
(C) The law of gravitation (D) Newton's third law
29. The inertia of a body depends on its _____.
(A) Mass (B) Speed
(C) Shape (D) Colour

30. The potential energy of a body of mass m raised to a height h above the ground is _____.

(A) $\frac{1}{2}mv^2$

(B) mgh

(C) mg

(D) $\frac{mgh}{2}$

31. The persistence of sound in a large hall after the source has stopped is called _____.

(A) An echo

(B) Resonance

(C) Reverberation

(D) Refraction

32. The shrillness or pitch of a sound depends on its _____.

(A) Amplitude

(B) Loudness

(C) Speed

(D) Frequency

33. Kwashiorkor, a deficiency disease seen in young children, is caused by a lack of _____.

(A) Protein

(B) Vitamin C

(C) Iron

(D) Calcium

34. Which of the following is a **biotic** component of an ecosystem?

(A) Sunlight

(B) Bacteria

(C) Soil

(D) Air

35. The greenhouse effect makes the earth warmer because certain gases _____.

(A) Reflect all sunlight back into space

(B) Produce heat by chemical reaction

(C) Trap the heat radiated by the earth's surface

(D) Cool the upper atmosphere

Section 2 — Science (contd.)

Q36–Q45 · 1 mark each

36. The weight of a body of mass 500 g on the earth's surface ($g = 10 \text{ m/s}^2$) is _____.

(A) 0.5 N

(B) 500 N

(C) 50 N

(D) 5 N

37. The number of moles of carbon atoms in 12 g of carbon is _____. ($C = 12 \text{ u}$)

(A) 1

(B) 0.5

(C) 6.022×10^{23}

(D) 12

38. A force of 20 N moves a body through 5 m along the direction of the force. The work done is _____.

(A) 4 J

(B) 100 J

(C) 25 J

(D) 100 W

39. A car moving at 30 m/s is brought to rest in 6 seconds. Its retardation is _____.

(A) 3 m/s^2

(B) 6 m/s^2

(C) 5 m/s^2

(D) 180 m/s^2

40. A block has a mass of 500 g and a volume of 250 cm^3 . Its density is _____.

(A) 0.5 g/cm^3

(B) 750 g/cm^3

(C) 125 g/cm^3

(D) 2 g/cm^3

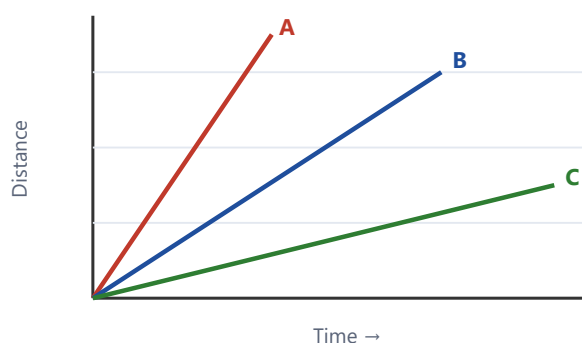
41. One row of the table below is **incorrectly** matched. Which row is it?

Row	Scientist	Contribution
(A)	Robert Hooke	First observed and named cells
(B)	Rutherford	Discovered the nucleus of the atom
(C)	Whittaker	Proposed the five-kingdom classification
(D)	Chadwick	Discovered the electron

Table 2.1 — Scientists and their contributions

- (A) (A) (B) (B)
(C) (C) (D) (D)

42. The distance–time graph shows three bodies A, B and C. Which body is moving **fastest**?



Distance–time graphs of three bodies starting together

- (A) A (B) B
(C) C (D) All three move at the same speed

43. Food cooks faster in a pressure cooker because the raised pressure _____.

- (A) Raises the boiling point of water (B) Lowers the boiling point of water
(C) Increases the amount of steam that escapes (D) Makes the food absorb less heat

44. Ultrasound is used in hospitals to _____.

- (A) Sterilise the operation theatre air (B) Form images of internal organs such as the liver and the unborn baby
(C) Measure a patient's temperature (D) Kill bacteria in the blood

45. Nitrogen from the air becomes available to a wheat crop most readily when the field is _____.

- (A) Left completely bare between crops (B) Watered with more water
(C) Sown with a legume crop in the previous season (D) Ploughed more deeply

Achievers Section

Q46–Q50 · 3 marks each

46. **Assertion (A):** Ice floats on water.

Reason (R): The density of ice is lower than that of water.

- (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true but R is not the correct explanation of A
(C) A is true but R is false (D) A is false but R is true

47. A ball of mass 0.5 kg strikes a wall horizontally at 10 m/s and rebounds along the same line at 10 m/s. The magnitude of the change in its momentum is _____.
(A) 0 kg·m/s (B) 5 kg·m/s
(C) 20 kg·m/s (D) 10 kg·m/s
48. The mass of one mole of glucose ($C_6H_{12}O_6$) is _____. (C = 12 u, H = 1 u, O = 16 u)
(A) 180 g (B) 162 g
(C) 150 g (D) 192 g
49. A student examines a plant section and sees long, hollow, dead cells with thick lignified walls, arranged end to end into continuous tubes. The tissue is most likely _____.
(A) Phloem (B) Xylem
(C) Parenchyma (D) Epidermis
50. Consider the three statements below.
(i) A body can have zero velocity and non-zero acceleration at the same instant.
(ii) All the cells of a multicellular organism have exactly the same function.
(iii) Compounds always contain their constituent elements in a fixed proportion by mass.
Which of them are **true**?
(A) (i) and (ii) only (B) (ii) and (iii) only
(C) (i) and (iii) only (D) All three

Answer Key

1	C	2	D	3	B	4	D	5	B
6	D	7	A	8	B	9	A	10	B
11	D	12	A	13	B	14	C	15	D
16	A	17	C	18	B	19	C	20	D
21	A	22	B	23	C	24	D	25	A
26	B	27	C	28	D	29	A	30	B
31	C	32	D	33	A	34	B	35	C
36	D	37	A	38	B	39	C	40	D
41	D	42	A	43	A	44	B	45	C
46	A	47	D	48	A	49	B	50	C

Solutions

1. Answer: (C) 243

Each term is three times the previous one: 3, 9, 27, 81. So the next term is $81 \times 3 = 243$.

2. Answer: (D) WD

The first letters run backwards from Z: Z, Y, X, **W**. The second letters run forwards from A: A, B, C, **D**. So the next pair is **WD**.

3. Answer: (B) 40

$P + E + N = 16 + 5 + 14 = 35$, so the code adds the letters' positions. For CUP: $3 + 21 + 16 = 40$.

4. Answer: (D) Mango

Wheat, rice and maize are cereal crops grown for their grain. **Mango** is a fruit crop, so it is the odd one out.

5. Answer: (B) Atmospheric pressure

A thermometer measures temperature, so the analogy asks what a barometer measures, which is **atmospheric pressure**. Humidity is measured by a hygrometer and rainfall by a rain gauge.

6. Answer: (D) 5 km

The two legs are at right angles, so the straight-line distance is $\sqrt{(3^2 + 4^2)} = \sqrt{25} = 5$ km. The 7 km figure would be the distance travelled, not the displacement.

7. Answer: (A) Tuesday

Divide by 7: $62 = 8 \times 7 + 6$, so the day advances by 6 from Wednesday. Counting on — Thursday, Friday, Saturday, Sunday, Monday, **Tuesday** — gives the answer.

8. Answer: (B) Husband

The only daughter of the woman's father is the woman herself. The man's wife is therefore the woman, which makes him her **husband**.

9. Answer: (A) P

R is left of P and T is left of R, giving T, R, P from the left. Q is right of P and S is right of Q, so the full order is T, R, **P**, Q, S. The middle seat, the third of five, belongs to **P**.

10. Answer: (B) 3

Removing two balls from each pan keeps the balance level, so one cube balances $5 - 2 = 3$ balls.

11. Answer: (D) Camphor

Camphor passes straight from solid to vapour without melting, as do naphthalene, ammonium chloride and dry ice. Salt and sugar melt or decompose, and copper melts at a very high temperature.

12. Answer: (A) Carries extra latent heat of vaporisation

Both are at the same temperature, but steam has additionally absorbed the **latent heat of vaporisation**, and it gives out that extra energy while condensing on the skin. This is why the injury is worse.

13. Answer: (B) Water

The solvent is the component present in the larger amount, in which the other dissolves. Here that is **water**, and sugar is the solute.

14. Answer: (C) Increases

Warmer water lets more solid dissolve, so solubility usually **increases** with temperature — sugar dissolves far more readily in hot tea than in cold water. (Gases behave the opposite way.)

15. Answer: (D) Chemical change

Rusting forms a new substance, hydrated iron oxide, whose properties differ completely from those of iron, and the change cannot be undone by simple physical means. It is therefore a **chemical change**.

16. Answer: (A) Fe

Iron's symbol **Fe** comes from its Latin name *ferrum*. Several older metals take symbols from Latin in the same way — Na for sodium (*natrium*) and K for potassium (*kalium*).

17. Answer: (C) 3

Atomicity counts the atoms in one molecule. An ozone molecule contains three oxygen atoms, so its atomicity is **3**, making it triatomic.

18. Answer: (B) J. J. Thomson

J. J. Thomson identified the electron through his cathode-ray experiments. Rutherford discovered the nucleus, Bohr proposed the shell model and Chadwick discovered the neutron.

19. Answer: (C) Na₂SO₄

Sodium has valency 1 and the sulphate ion SO₄ carries valency 2, so two sodium ions are needed for each sulphate: **Na₂SO₄**.

20. Answer: (D) Has no well-defined nucleus bounded by a membrane

A prokaryotic cell **lacks a nuclear membrane**, so its genetic material lies free in the cytoplasm as a nucleoid. It does have DNA and does reproduce, and most bacteria also have a cell wall.

21. Answer: (A) Stomata

Stomata, each guarded by a pair of guard cells, allow carbon dioxide in and oxygen out, and they are also the main route for transpiration. Lenticels serve a similar purpose in woody stems.

22. Answer: (B) Work under our conscious control

Skeletal muscles are attached to bones and move **when we choose to move them**, so they are voluntary. Smooth muscles of the gut and cardiac muscle of the heart work without conscious control.

23. Answer: (C) Epithelial tissue

Epithelial tissue forms continuous sheets of tightly packed cells that cover the body and line its cavities, acting as a barrier and controlling what passes across.

24. Answer: (D) Genus

In binomial nomenclature the first word is the **genus**, written with a capital initial, and the second is the species. Both are italicised, or underlined when written by hand.

25. Answer: (A) Sponges

Porifera means "pore-bearing", and these animals are the **sponges**. Water is drawn in through their many pores, and their cells are not organised into true tissues.

26. Answer: (B) Distance

Distance has magnitude only, so it is a scalar. Displacement, velocity and acceleration all need a direction as well, which makes them vectors.

27. Answer: (C) Reach the ground at the same time

The acceleration due to gravity is the same for every body, whatever its mass, so both would **land together**. In ordinary air the feather is slowed by air resistance, which is what makes it seem otherwise.

28. Answer: (D) Newton's third law

The swimmer's hands push the water backwards, and the water pushes the swimmer forwards with an equal and opposite force. That pairing is **Newton's third law**.

29. Answer: (A) Mass

The greater the **mass**, the harder it is to change a body's state of rest or motion. That is why a loaded truck is much harder to stop than a bicycle moving at the same speed.

30. Answer: (B) mgh

The work done in lifting the body against gravity is force × height = **mgh**, and this is stored as gravitational potential energy. The expression $\frac{1}{2}mv^2$ is kinetic energy.

31. Answer: (C) Reverberation

Reverberation is the repeated reflection of sound from walls, ceiling and floor, so the sound seems to linger. An echo is a single distinct reflection heard separately from the original sound.

32. Answer: (D) Frequency

A higher **frequency** is heard as a higher pitch, which is why a whistle sounds shriller than a drum. Amplitude decides loudness, not pitch.

33. Answer: (A) Protein

Kwashiorkor results from a diet with enough calories but too little **protein**, causing stunted growth, thin limbs and a swollen belly. Lack of vitamin C causes scurvy and lack of iron causes anaemia.

34. Answer: (B) Bacteria

Biotic components are the living ones, so **bacteria** qualify. Sunlight, soil and air are non-living, or abiotic, components.

35. Answer: (C) Trap the heat radiated by the earth's surface

Gases such as carbon dioxide, methane and water vapour let visible sunlight through but absorb the longer-wavelength heat radiated back from the ground, so they **trap that heat** in the atmosphere. Without it the earth would be far colder, but rising levels are now warming it too much.

36. Answer: (D) 5 N

First convert the mass to SI units: 500 g = 0.5 kg. Then $W = mg = 0.5 \times 10 = \mathbf{5\ N}$.

37. Answer: (A) 1

The molar mass of carbon is 12 g, so 12 g is exactly **1 mole**. That single mole contains 6.022×10^{23} atoms, but the number of moles is 1.

38. Answer: (B) 100 J

Work = force $\times$ displacement = $20 \times 5 = \mathbf{100\ J}$.

39. Answer: (C) 5 m/s²

Using $v = u + at$ with $v = 0$: $0 = 30 + 6a$, so $a = -5\ \text{m/s}^2$. The retardation is therefore **5 m/s²**.

40. Answer: (D) 2 g/cm³

Density = mass $\div$ volume = $500 \div 250 = \mathbf{2\ g/cm^3}$. Being denser than water (1 g/cm³), this block would sink.

41. Answer: (D) (D)

Chadwick discovered the *neutron*; it was J. J. Thomson who discovered the electron. So row **(D)** is wrong, while the other three are correctly matched.

42. Answer: (A) A

On a distance–time graph the slope is the speed, so the steepest line belongs to the fastest body. Line **A** is the steepest — it covers the greatest distance in the least time — and C, the flattest, is the slowest.

43. Answer: (A) Raises the boiling point of water

Boiling occurs when the vapour pressure matches the pressure above the liquid, so a higher pressure inside the cooker **raises the boiling point** above 100 °C. The hotter water cooks the food faster.

44. Answer: (B) Form images of internal organs such as the liver and the unborn baby

Ultrasonic waves are reflected differently by tissues of different densities, and a scanner converts the returning echoes into an image. So ultrasound is used to **see internal organs and the developing foetus** without any surgery.

45. Answer: (C) Sown with a legume crop in the previous season

Legumes carry *Rhizobium* in their root nodules, and these bacteria fix atmospheric nitrogen into compounds that stay in the soil. **Growing a legume in the previous season** therefore leaves the field richer in nitrogen for the wheat that follows.

46. Answer: (A) Both A and R are true and R is the correct explanation of A

Water expands as it freezes, so ice has a density of about 0.92 g/cm³ against water's 1 g/cm³. A body less dense than a liquid floats in it, so both statements are true and the lower density is exactly **why** ice floats.

47. Answer: (D) 10 kg·m/s

Taking the initial direction as positive, the momentum changes from $+0.5 \times 10 = +5$ kg·m/s to $-0.5 \times 10 = -5$ kg·m/s. The change is $-5 - (+5) = -10$, so its magnitude is **10 kg·m/s**. Overlooking the reversal of direction gives the wrong answer of zero.

48. Answer: (A) 180 g

Carbon contributes $6 \times 12 = 72$, hydrogen $12 \times 1 = 12$ and oxygen $6 \times 16 = 96$. Adding, $72 + 12 + 96 =$ **180 g** per mole.

49. Answer: (B) Xylem

Dead cells with thick lignified walls joined end to end into unbroken tubes describe the vessels and tracheids of **xylem**, which carry water upward. Phloem cells are living, and parenchyma cells are thin-walled and roughly rounded.

50. Answer: (C) (i) and (iii) only

Statement (i) is true — a ball thrown upward is momentarily at rest at the highest point, yet gravity still gives it an acceleration of 10 m/s^2 downward. Statement (ii) is false, since division of labour means cells specialise into different tissues. Statement (iii) is true and is the law of constant proportions. So **(i) and (iii)** hold.