

Full Practice Exam — Set 2

Science · Class 10 · Full Syllabus Practice Exam

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

INSTRUCTIONS

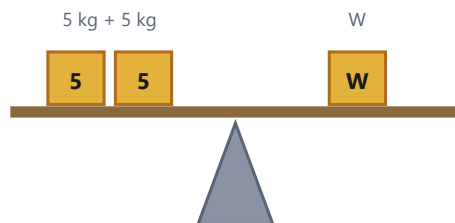
- There are **50 questions** in this paper. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–45 carry **1 mark** each. Questions 46–50 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Study every diagram and table carefully.
- Rough work may be done in the space at the side of each page.

Section 1 — Logical Reasoning

Q1–Q10 · 1 mark each

- What comes next in the series? 100, 50, 25, 12.5, ____
 (A) 5 (B) 6.25
 (C) 7.5 (D) 10
- What comes next in the series? ZXV, TRP, NLJ, ____
 (A) GFD (B) HGE
 (C) IGE (D) HFD
- If SCIENCE is written as ECNEICS, then PHYSICS is written as _____.
 (A) SCIIYSH (B) SCISYHP
 (C) SYCISHP (D) PHSICYS
- Find the **odd one out**: sodium, potassium, calcium, chlorine
 (A) Sodium (B) Potassium
 (C) Calcium (D) Chlorine
- Complete the analogy: Bulb : Light :: Electric fan : ____
 (A) Heat (B) Motion
 (C) Sound (D) Chemical change
- A boy walks 4 km north, then 3 km west. In which direction is he now from his starting point?
 (A) North-east (B) South-east
 (C) North-west (D) South-west
- P is the father of Q, and Q is the daughter of R. How is R related to P?
 (A) Son (B) Daughter
 (C) Brother (D) Wife
- In a row of 25 plants, a marigold is 8th from the left end. What is its position from the right end?
 (A) 18th (B) 17th
 (C) 16th (D) 19th

9. All metals conduct electricity. Silver is a metal. Which conclusion follows?
- (A) Everything that conducts electricity is silver (B) Silver conducts electricity
(C) Silver is the best conductor (D) No conclusion can be drawn
10. The see-saw shown is balanced. Weights are placed at equal distances on either side of the pivot. What must the unknown weight W be?



every block stands 1 m from the pivot

A balanced see-saw with weights at equal distances from the pivot

- (A) 5 kg (B) 15 kg
(C) 10 kg (D) 25 kg

Section 2 — Science

Q11–Q35 · 1 mark each

11. On heating, lead nitrate gives off a brown gas. That gas is _____.
(A) Hydrogen (B) Oxygen
(C) Carbon dioxide (D) Nitrogen dioxide
12. Rain is described as acid rain when its pH falls below about _____.
(A) 5.6 (B) 6.5
(C) 7 (D) 3
13. Which oxide is **amphoteric**, reacting with both acids and bases?
(A) Sodium oxide (B) Aluminium oxide
(C) Carbon dioxide (D) Calcium oxide
14. Heating a sulphide ore strongly in the presence of excess air is called _____.
(A) Reduction (B) Calcination
(C) Roasting (D) Electrolysis
15. Covalent compounds generally _____.
(A) Exist only as gases (B) Have high melting points and conduct well
(C) Always dissolve in water (D) Have low melting points and conduct electricity poorly
16. The chemical name of the acid present in vinegar is _____.
(A) Ethanoic acid (B) Citric acid
(C) Sulphuric acid (D) Lactic acid
17. A soap molecule cleans greasy cloth because it has _____.
(A) Two water-attracting ends (B) A water-attracting head and an oil-attracting tail
(C) Two oil-attracting ends (D) No charge at all

18. The overall equation for aerobic respiration in cells is _____.
(A) Glucose + oxygen → carbon dioxide + water + energy
(B) Carbon dioxide + water → glucose + oxygen
(C) Glucose → ethanol + carbon dioxide + energy
(D) Glucose → lactic acid + energy
19. The alveoli of the lungs are well suited to gas exchange because they _____.
(A) Have thick walls
(B) Are filled with muscle
(C) Provide a very large surface area richly supplied with blood capillaries
(D) Contain chlorophyll
20. Water rises to the top of a tall tree mainly because of _____.
(A) Translocation through the phloem
(B) The pumping action of the root cells alone
(C) The weight of the water above
(D) The transpiration pull created in the leaves
21. Plants get rid of excess water through _____.
(A) Transpiration
(B) Sweating
(C) The kidneys
(D) Digestion
22. The plant hormone that promotes the elongation of stems is _____.
(A) Absciscic acid
(B) Gibberellin
(C) Insulin
(D) Adrenaline
23. In human beings, the placenta is important because it _____.
(A) Produces sperm
(B) Stores the egg before fertilisation
(C) Allows the exchange of nutrients, oxygen and wastes between mother and embryo
(D) Digests food for the mother
24. When a pure tall pea plant (TT) is crossed with a pure dwarf one (tt), the F₁ plants are _____.
(A) Three tall to one dwarf
(B) All dwarf
(C) Half tall and half dwarf
(D) All tall
25. Two populations of the same species stop interbreeding and gradually become separate species. This process is called _____.
(A) Speciation
(B) Regeneration
(C) Fertilisation
(D) Pollination
26. The image formed by a convex mirror is always _____.
(A) Real and inverted
(B) Virtual, erect and diminished
(C) Real and magnified
(D) Virtual and magnified
27. The refractive index of glass is 1.5 and the speed of light in vacuum is 3×10^8 m/s. The speed of light in glass is _____.
(A) 4.5×10^8 m/s
(B) 1.5×10^8 m/s
(C) 2×10^8 m/s
(D) 3×10^8 m/s
28. The resistivity of a wire depends on _____.
(A) The current flowing through it
(B) The length of the wire only
(C) The thickness of the wire only
(D) The material of the wire and its temperature

29. The heat produced in a resistor carrying current is given by _____.
 (A) $H = I^2Rt$ (B) $H = IRt$
 (C) $H = \frac{I^2t}{R}$ (D) $H = IR^2t$
30. The core of an electromagnet is made of soft iron because soft iron _____.
 (A) Stays permanently magnetised (B) Becomes strongly magnetic while the current flows and loses it when the current stops
 (C) Cannot be magnetised at all (D) Conducts electricity better than copper
31. The frequency of the alternating current supplied in India is _____.
 (A) 100 Hz (B) 60 Hz
 (C) 50 Hz (D) 220 Hz
32. Which of the following is **non-biodegradable**?
 (A) Paper (B) Cotton cloth
 (C) Cow dung (D) Polythene bag
33. The three R's recommended for the sustainable use of resources are _____.
 (A) Reduce, recycle and reuse (B) Remove, refill and reuse
 (C) Reduce, refuse and rebuild (D) Repair, refill and reuse
34. A dam built across a river brings which pair of benefits?
 (A) Increased rainfall and reduced evaporation (B) Irrigation and electricity generation
 (C) More fossil fuel and less silt (D) Cooling of the atmosphere and more ozone
35. Which of these energy sources produces no greenhouse gases while it is operating?
 (A) A coal-fired power station (B) A diesel generator
 (C) A solar panel (D) A wood-burning stove

Section 2 — Science (contd.)

Q36–Q45 · 1 mark each

36. Two resistors of $3\ \Omega$ and $6\ \Omega$ are connected in parallel. Their combined resistance is _____.
 (A) $18\ \Omega$ (B) $4.5\ \Omega$
 (C) $9\ \Omega$ (D) $2\ \Omega$
37. An electric iron rated 750 W is used for 4 hours. The energy consumed is _____.
 (A) 3 kWh (B) 0.75 kWh
 (C) 30 kWh (D) 3000 kWh
38. The focal length of a concave mirror is 15 cm. Its radius of curvature is _____.
 (A) 7.5 cm (B) 30 cm
 (C) 15 cm (D) 45 cm
39. A solution has a pH of 4. Adding a little sodium hydroxide solution to it will _____.
 (A) Leave the pH unchanged (B) Lower the pH towards 1
 (C) Raise the pH towards 7 (D) Turn the solution into an acid gas
40. In the food chain phytoplankton → small fish → large fish → bird, if 10 000 kJ of energy is present in the phytoplankton, the energy reaching the bird is about _____.
 (A) 1000 kJ (B) 100 kJ
 (C) 1 kJ (D) 10 kJ

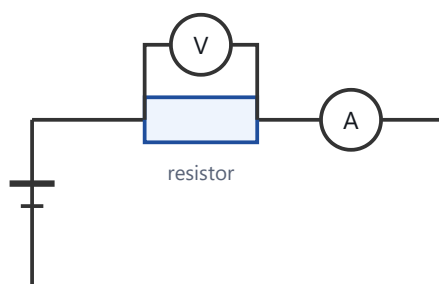
41. One row of the table below is **incorrectly** matched. Which row is it?

Row	Organ	Function
(A)	Pancreas	Pumps blood around the body
(B)	Liver	Secretes bile, which emulsifies fats
(C)	Kidney	Filters the blood and forms urine
(D)	Lungs	Exchange oxygen and carbon dioxide with the blood

Table 2.1 — Organs and their functions

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

42. The circuit below shows a cell, a resistor, an ammeter and a voltmeter. Which instrument is connected correctly?



A circuit containing an ammeter (A) and a voltmeter (V)

- (A) Only the ammeter, which is in series (B) Only the voltmeter, which is in parallel
(C) Both are connected correctly (D) Neither is connected correctly

43. Iron articles are painted mainly to _____.

- (A) Keep out air and moisture and so prevent rusting (B) Increase their weight
(C) Make them conduct electricity (D) Make them magnetic

44. A person with blurred vision is found to have an image forming behind the retina. This person suffers from _____.

- (A) Myopia (B) Hypermetropia
(C) Cataract (D) Colour blindness

45. Groundwater is best conserved by _____.

- (A) Cementing over open ground (B) Digging more and deeper borewells
(C) Rainwater harvesting and reducing wasteful use (D) Draining ponds and lakes

Achievers Section

Q46–Q50 · 3 marks each

46. **Assertion (A):** Soap is not effective for cleaning clothes in hard water.

Reason (R): Soap reacts with the calcium and magnesium salts in hard water to form an insoluble scum.

- (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 $6\ \Omega$ resistor and a $3\ \Omega$ resistor are joined in parallel, and this combination is connected in series with a $4\ \Omega$ resistor across a 12 V battery. The current drawn from the battery is _____.
(A) 1 A (B) 4 A
(C) 3 A (D) 2 A
48. A white powder, when heated strongly, gives a colourless gas that turns lime water milky and leaves a white solid that dissolves in water to give an alkaline solution. The powder is most likely _____.
(A) Calcium carbonate (B) Sodium chloride
(C) Copper sulphate (D) Ammonium chloride
49. A student blocks the stomata on the lower surface of the leaves of a potted plant with petroleum jelly and leaves the plant in sunlight. Which pair of effects should be expected?
(A) Transpiration increases and photosynthesis is unaffected (B) Both transpiration and photosynthesis are reduced
(C) Only transpiration is affected; photosynthesis continues at the same rate (D) The plant grows faster because it loses less water
50. Consider the three statements below.
(i) The resistance of a conductor increases as its length increases.
(ii) In a series circuit the current is the same through every component.
(iii) All acids are dangerous and none occur in food.
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	B	2	D	3	B	4	D	5	B
6	C	7	D	8	A	9	B	10	C
11	D	12	A	13	B	14	C	15	D
16	A	17	B	18	A	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	A	42	C	43	A	44	B	45	C
46	A	47	D	48	A	49	B	50	A

Solutions

1. Answer: (B) 6.25

Each term is half the one before it, so the next is $12.5 \div 2 = \mathbf{6.25}$.

2. Answer: (D) HFD

Within each group the letters step back two at a time (Z, X, V), and the groups themselves start six letters earlier each time: Z, T, N, **H**. So the next group is **HFD**.

3. Answer: (B) SCISYHP

The code simply reverses the letters. Reversing PHYSICS gives **SCISYHP**.

4. Answer: (D) Chlorine

Sodium, potassium and calcium are metals that lose electrons to form positive ions. **Chlorine** is a non-metal that gains an electron, so it is the odd one out.

5. Answer: (B) Motion

A bulb converts electrical energy into light, so the analogy asks what a fan produces, which is **motion** — mechanical energy.

6. Answer: (C) North-west

Moving north and then west leaves him above and to the left of where he began, that is **north-west** of his starting point (5 km away, by Pythagoras).

7. Answer: (D) Wife

Q has P for a father and R for a parent as well, and since Q is R's daughter, R must be Q's mother. So R is P's **wife**.

8. Answer: (A) 18th

Position from the right = $25 - 8 + 1 = \mathbf{18th}$.

9. Answer: (B) Silver conducts electricity

The two statements combine directly: silver belongs to a group all of whose members conduct, so **silver conducts electricity**. The reverse claim does not follow, since graphite conducts without being a metal.

10. Answer: (C) 10 kg

The see-saw balances when the turning effects match. Both sides act at the same distance from the pivot, so the weights themselves must be equal: $5 + 5 = \mathbf{10\ kg}$.

11. Answer: (D) Nitrogen dioxide

Lead nitrate decomposes into lead oxide, oxygen and brown fumes of **nitrogen dioxide**. The colour of the fumes is the give-away, since oxygen and carbon dioxide are colourless.

12. Answer: (A) 5.6

Ordinary rain is slightly acidic because it dissolves carbon dioxide, giving a pH of about 5.6. Below that value the acidity comes from pollutants, so the rain counts as **acid rain**.

13. Answer: (B) Aluminium oxide

Aluminium oxide behaves as a base towards acids and as an acid towards alkalis, so it is amphoteric. Zinc oxide behaves the same way, while sodium and calcium oxides are purely basic.

14. Answer: (C) Roasting

Roasting converts a sulphide ore to its oxide by heating it in air. Calcination is the corresponding treatment of a carbonate ore, carried out in the absence of air.

15. Answer: (D) Have low melting points and conduct electricity poorly

The forces *between* covalent molecules are weak even though the bonds within them are strong, so such compounds melt easily. Having no free ions or electrons, they also **conduct electricity poorly**.

16. Answer: (A) Ethanoic acid

Vinegar is a dilute solution of **ethanoic acid** (acetic acid), CH_3COOH , usually about 5 to 8 per cent. Citric acid is found in lemons and lactic acid in sour milk.

17. Answer: (B) A water-attracting head and an oil-attracting tail

The ionic head dissolves in water while the long hydrocarbon tail buries itself in the grease, so soap molecules surround the dirt as micelles that rinse away. This double nature — **a water-loving head and an oil-loving tail** — is what makes cleaning possible.

18. Answer: (A) Glucose + oxygen → carbon dioxide + water + energy

Aerobic respiration breaks glucose down completely: **glucose + oxygen → carbon dioxide + water + energy**. The second option is photosynthesis, and the last two are anaerobic pathways that release far less energy.

19. Answer: (C) Provide a very large surface area richly supplied with blood capillaries

Millions of tiny air sacs give an enormous surface, each wrapped in capillaries and only one cell thick, so oxygen and carbon dioxide diffuse quickly. That **large, well-supplied surface** is what makes the lungs efficient.

20. Answer: (D) The transpiration pull created in the leaves

As water evaporates from the leaves, it pulls the continuous column of water in the xylem upward. This **transpiration pull** can lift water many metres without any pump.

21. Answer: (A) Transpiration

Plants have no excretory organs; they release surplus water as vapour through the stomata by **transpiration**, and store other wastes in leaves that fall, or in resins and gums.

22. Answer: (B) Gibberellin

Gibberellins cause marked stem elongation and help seeds to germinate. Absciscic acid works in the opposite direction, inhibiting growth and closing stomata, while insulin and adrenaline are animal hormones.

23. Answer: (C) Allows the exchange of nutrients, oxygen and wastes between mother and embryo

The placenta is a disc of tissue with villi on the embryo's side dipping into the mother's blood spaces, so **glucose and oxygen pass to the embryo and its wastes pass back** for the mother to remove.

24. Answer: (D) All tall

Every F_1 plant receives one T and one t, and since T is dominant they are **all tall**, though each carries the hidden dwarf allele. The 3 : 1 ratio appears only in the next generation.

25. Answer: (A) Speciation

Speciation occurs when gene flow between two populations is cut off — often by a geographical barrier — and variation and natural selection then push them apart until they can no longer interbreed.

26. Answer: (B) Virtual, erect and diminished

Wherever the object is placed, a convex mirror forms an image that is **virtual, erect and smaller than the object**, located behind the mirror. That is why it gives such a wide field of view.

27. Answer: (C) 2×10^8 m/s

Since $n = \frac{c}{v}$, we get $v = \frac{c}{n}$. Dividing 3×10^8 by 1.5 gives **2×10^8 m/s** — light always travels more slowly in a medium than in vacuum.

28. Answer: (D) The material of the wire and its temperature

Resistivity is a property of the **material and its temperature**, not of the piece of wire. Length and area change the resistance of a particular wire but leave its resistivity unchanged.

29. Answer: (A) $H = I^2Rt$

Joule's law of heating gives **$H = I^2Rt$** . Because the current is squared, doubling it produces four times as much heat, which is why overloaded wiring becomes dangerously hot.

- 30. Answer: (B)** Becomes strongly magnetic while the current flows and loses it when the current stops
Soft iron **magnetises strongly but only while the current flows**, so the electromagnet can be switched on and off. Steel is used where a permanent magnet is wanted.
- 31. Answer: (C)** 50 Hz
Indian mains supply alternates at **50 Hz**, so the current reverses direction 100 times each second. The figure 220 refers to the voltage, not the frequency.
- 32. Answer: (D)** Polythene bag
A **polythene bag** is not broken down by decomposers and can persist for centuries. Paper, cotton and cow dung are all biodegradable.
- 33. Answer: (A)** Reduce, recycle and reuse
Reduce, recycle and reuse together cut the demand on natural resources and the amount of waste produced — reducing consumption being the most effective of the three.
- 34. Answer: (B)** Irrigation and electricity generation
A dam stores water for **irrigation** and lets the falling water drive turbines to generate **electricity**. Those benefits have to be weighed against the displacement of people and the loss of habitat upstream.
- 35. Answer: (C)** A solar panel
A **solar panel** converts sunlight straight into electricity, releasing nothing while it works. The other three all burn a fuel and release carbon dioxide.
- 36. Answer: (D)** $2\ \Omega$
For a parallel pair, $\frac{1}{R} = \frac{1}{3} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$, so $R = 2\ \Omega$ — smaller than either resistor, as parallel combinations always are.
- 37. Answer: (A)** 3 kWh
Energy = $0.75\ \text{kW} \times 4\ \text{h} = 3\ \text{kWh}$, that is 3 units.
- 38. Answer: (B)** 30 cm
For a spherical mirror the radius of curvature is twice the focal length: $R = 2f = 30\ \text{cm}$.
- 39. Answer: (C)** Raise the pH towards 7
Sodium hydroxide is a base, so it neutralises part of the acid and **raises the pH towards 7**. Adding more acid instead would push the pH lower.
- 40. Answer: (D)** 10 kJ
About a tenth of the energy passes on at each step: $10\ 000 \rightarrow 1000 \rightarrow 100 \rightarrow 10\ \text{kJ}$ for the bird, three steps above the producer.
- 41. Answer: (A)** (A)
The pancreas secretes digestive enzymes and the hormone insulin; pumping blood is the work of the heart. So row **(A)** is wrong, while the other three are correctly matched.
- 42. Answer: (C)** Both are connected correctly
An ammeter must carry the whole current, so it belongs in series, and the diagram shows it in the main loop. A voltmeter must measure the potential difference across a component, so it belongs in parallel, and the diagram shows it bridging the resistor. Hence **both are connected correctly**.
- 43. Answer: (A)** Keep out air and moisture and so prevent rusting
Rusting needs both oxygen and water at the iron surface. A coat of paint **seals the surface from air and moisture**, so the reaction cannot begin. Greasing and galvanising work on the same principle.
- 44. Answer: (B)** Hypermetropia
When the eye's converging power is too weak, or the eyeball too short, the image falls behind the retina — the defect called **hypermetropia**, corrected with a convex lens.

45. Answer: (C) Rainwater harvesting and reducing wasteful use

The water table falls when extraction outpaces recharge, so **harvesting rain and cutting wasteful use** is the remedy. Deeper borewells and paved ground both make the problem worse, the first by drawing more and the second by blocking recharge.

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

Hard water contains dissolved calcium and magnesium salts, and the soap is used up forming a sticky insoluble scum with them instead of lathering. Both statements are true and the scum is exactly **why** soap fails, so R explains A. Detergents avoid the problem because their calcium and magnesium salts stay soluble.

47. Answer: (D) 2 A

The parallel pair gives $\frac{1}{R} = \frac{1}{6} + \frac{1}{3} = \frac{1}{2}$, so $R = 2 \Omega$. Adding the series resistor, the total is $2 + 4 = 6 \Omega$. Hence $I = \frac{12}{6} = 2 \text{ A}$.

48. Answer: (A) Calcium carbonate

The gas turning lime water milky is carbon dioxide, so the powder is a carbonate; the alkaline residue is a metal oxide. **Calcium carbonate** fits exactly: $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$, and the quicklime left behind dissolves to give alkaline lime water.

49. Answer: (B) Both transpiration and photosynthesis are reduced

Stomata serve two purposes at once: water vapour leaves through them and carbon dioxide enters through them. Sealing them therefore cuts water loss *and* starves the leaf of carbon dioxide, so **both transpiration and photosynthesis are reduced**.

50. Answer: (A) (i) and (ii) only

Statement (i) is true, since $R = \frac{\rho l}{A}$ grows with length. Statement (ii) is true, because a series circuit offers only one path.

Statement (iii) is false — citric acid in lemons, ethanoic acid in vinegar and lactic acid in curd are all edible. So **(i) and (ii)** hold.