

# Full Practice Exam — Set 1

Science · Class 10 · Full Syllabus Practice Exam

|                    |                 |                   |                        |
|--------------------|-----------------|-------------------|------------------------|
| TIME<br>60 minutes | QUESTIONS<br>50 | TOTAL MARKS<br>60 | MAX. SCORE<br>___ / 60 |
|--------------------|-----------------|-------------------|------------------------|

Name: \_\_\_\_\_ Class/Sec: \_\_\_\_\_ Date: \_\_\_\_\_

## INSTRUCTIONS

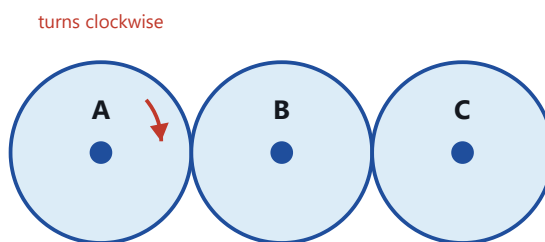
- There are **50 questions** in this paper. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–45 carry **1 mark** each. Questions 46–50 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Study 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? 5, 10, 20, 40, \_\_\_\_  
 (A) 50 (B) 60  
 (C) 80 (D) 100
- What comes next in the series? BCD, FGH, JKL, \_\_\_\_  
 (A) MNO (B) OPQ  
 (C) NPQ (D) NOP
- If CAT is coded as 24 using the positions of the letters in the alphabet, then DOG is coded as \_\_\_\_\_.  
 (A) 24 (B) 26  
 (C) 28 (D) 30
- Find the **odd one out**: copper, silver, gold, graphite  
 (A) Graphite (B) Silver  
 (C) Gold (D) Copper
- Complete the analogy: Ammeter : Current :: Voltmeter : \_\_\_\_  
 (A) Resistance (B) Charge  
 (C) Power (D) Potential difference
- A man walks 5 km south and then 12 km east. How far is he from his starting point?  
 (A) 13 km (B) 7 km  
 (C) 17 km (D) 60 km
- B is the sister of C, and C is the son of D. How is B related to D?  
 (A) Son (B) Sister  
 (C) Daughter (D) Mother
- In an examination Anita ranks 12th from the top and 25th from the bottom. How many students appeared?  
 (A) 35 (B) 36  
 (C) 37 (D) 38

9. Which is heavier: one kilogram of iron or one kilogram of cotton?
- (A) The iron (B) The cotton  
(C) Both weigh the same (D) It cannot be decided
10. Three gears are meshed together as shown. If gear A turns clockwise, in which direction does gear C turn?



Three meshed gears A, B and C

- (A) First one way, then the other (B) Anticlockwise  
(C) It does not turn (D) Clockwise

## Section 2 — Science

Q11–Q35 · 1 mark each

11. The balanced equation for the burning of magnesium in air is \_\_\_\_\_.  
(A)  $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$  (B)  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$   
(C)  $\text{Mg} + 2\text{O}_2 \rightarrow \text{MgO}_2$  (D)  $2\text{Mg} + 2\text{O}_2 \rightarrow 2\text{MgO}$
12. When dilute hydrochloric acid is added to sodium carbonate, the gas released turns lime water milky. That gas is \_\_\_\_\_.  
(A) Carbon dioxide (B) Oxygen  
(C) Hydrogen (D) Chlorine
13. The pH of the gastric juice in the human stomach is about \_\_\_\_\_.  
(A) 8.5 (B) 7  
(C) 1.5 (D) 11
14. Metal oxides are generally \_\_\_\_\_ in nature.  
(A) Acidic (B) Amphoteric  
(C) Neutral (D) Basic
15. Which metal will displace iron from a solution of iron sulphate?  
(A) Aluminium (B) Silver  
(C) Copper (D) Gold
16. Steel is an alloy of iron with a small amount of \_\_\_\_\_.  
(A) Zinc (B) Carbon  
(C) Tin (D) Lead
17. The general formula of the alkane series is \_\_\_\_\_.  
(A)  $\text{C}_n\text{H}_{2n}$  (B)  $\text{C}_n\text{H}_{2n-2}$   
(C)  $\text{C}_n\text{H}_{2n+2}$  (D)  $\text{C}_n\text{H}_n$

- 18.** Detergents clean better than soaps in hard water because detergents \_\_\_\_\_.  
(A) Contain more water (B) Are stronger acids  
(C) Dissolve the hardness completely (D) Do not form an insoluble scum with calcium and magnesium salts
- 19.** The raw materials needed for photosynthesis are \_\_\_\_\_.  
(A) Carbon dioxide and water (B) Oxygen and water  
(C) Glucose and oxygen (D) Nitrogen and water
- 20.** The opening and closing of a stoma is controlled by \_\_\_\_\_.  
(A) Epidermal hairs (B) Guard cells  
(C) Xylem vessels (D) Root hairs
- 21.** The component of blood responsible for clotting is the \_\_\_\_\_.  
(A) Red blood cells (B) White blood cells  
(C) Platelets (D) Plasma proteins alone
- 22.** In a nephron, the filtration of blood takes place in the \_\_\_\_\_.  
(A) Collecting duct (B) Ureter  
(C) Urinary bladder (D) Glomerulus
- 23.** A deficiency of iodine in the diet leads to a shortage of the hormone \_\_\_\_\_.  
(A) Thyroxine (B) Insulin  
(C) Adrenaline (D) Growth hormone
- 24.** The transfer of pollen from the anther of one flower to the stigma of a flower on a different plant is called \_\_\_\_\_.  
(A) Self-pollination (B) Cross-pollination  
(C) Fertilisation (D) Germination
- 25.** In Mendel's experiments, the trait that appears in the  $F_1$  generation is called the \_\_\_\_\_ trait.  
(A) Recessive (B) Acquired  
(C) Dominant (D) Hybrid
- 26.** Fossils are important in the study of evolution because they \_\_\_\_\_.  
(A) Show the diet of modern animals (B) Prove that species never change  
(C) Are the remains of living organisms only (D) Show what organisms of the past were like and when they lived
- 27.** A concave mirror is also called a \_\_\_\_\_ mirror.  
(A) Converging (B) Diverging  
(C) Plane (D) Cylindrical
- 28.** When a ray of light passes from air into glass, it bends \_\_\_\_\_.  
(A) Away from the normal (B) Towards the normal  
(C) Along the normal (D) Not at all
- 29.** The power of a lens is measured in \_\_\_\_\_.  
(A) Metres (B) Dioptres  
(C) Watts (D) Newtons

30. A potential difference of 12 V is applied across a  $4\ \Omega$  resistor. The current through it is \_\_\_\_\_.  
 (A) 0.33 A (B) 8 A  
 (C) 3 A (D) 48 A
31. Household appliances are connected in parallel rather than in series because \_\_\_\_\_.  
 (A) It makes the total resistance larger (B) It uses less wire  
 (C) The current then flows only one way (D) Each appliance then gets the full supply voltage and can be switched on or off independently
32. The magnetic field pattern of a current-carrying solenoid resembles that of a \_\_\_\_\_.  
 (A) Bar magnet (B) Straight wire  
 (C) Single circular loop (D) Horseshoe with no poles
33. An electric generator works on the principle of \_\_\_\_\_.  
 (A) The heating effect of current (B) Electromagnetic induction  
 (C) The chemical effect of current (D) Ohm's law
34. The thinning of the ozone layer is caused mainly by \_\_\_\_\_.  
 (A) Oxygen (B) Carbon dioxide  
 (C) Chlorofluorocarbons (CFCs) (D) Water vapour
35. In the food chain grass → grasshopper → frog → snake, the frog occupies the \_\_\_\_\_ trophic level.  
 (A) First (B) Second  
 (C) Fourth (D) Third

## Section 2 — Science (contd.)

Q36–Q45 · 1 mark each

36. A 1000 W electric heater runs for 2 hours. The electrical energy it consumes is \_\_\_\_\_.  
 (A) 2 kWh (B) 200 kWh  
 (C) 0.5 kWh (D) 2000 kWh
37. A potential difference of 6 V across a wire drives a current of 0.5 A. The resistance of the wire is \_\_\_\_\_.  
 (A)  $3\ \Omega$  (B)  $12\ \Omega$   
 (C)  $6\ \Omega$  (D)  $0.08\ \Omega$
38. The power of a lens is  $-2\text{ D}$ . Its focal length and type are \_\_\_\_\_.  
 (A) 50 cm, convex (B)  $-2\text{ cm}$ , concave  
 (C)  $-50\text{ cm}$ , concave (D) 2 m, convex
39. An object 4 cm high produces an image 12 cm high in a concave mirror. The magnification is \_\_\_\_\_.  
 (A)  $\frac{1}{3}$  (B) 48  
 (C) 8 (D) 3
40. A solution turns red litmus blue. Its pH is most likely \_\_\_\_\_.  
 (A) 2 (B) 5  
 (C) 7 (D) 10

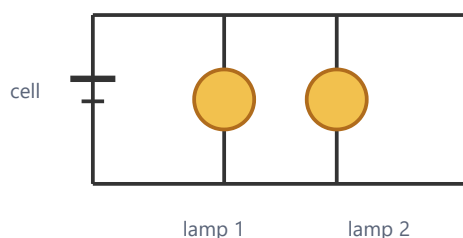
41. One row of the table below is **incorrectly** matched. Which row is it?

| Row | Term           | Meaning                                               |
|-----|----------------|-------------------------------------------------------|
| (A) | Oxidation      | Gain of oxygen or loss of hydrogen                    |
| (B) | Corrosion      | Slow eating away of a metal surface                   |
| (C) | Rancidity      | Formation of rust on iron                             |
| (D) | Neutralisation | Reaction of an acid with a base giving salt and water |

Table 1.1 — Chemical terms and their meanings

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

42. In the circuit shown, the two lamps are connected in parallel across the cell. If one lamp fuses, the other \_\_\_\_\_.



Two lamps connected in parallel across a cell

- (A) Keeps glowing at the same brightness (B) Also stops glowing  
(C) Glows more dimly (D) Glows twice as brightly
43. LED bulbs are preferred to filament bulbs mainly because they \_\_\_\_\_.  
(A) Are heavier (B) Convert a much larger share of the electrical energy into light  
(C) Give out more heat (D) Work only on high voltage
44. Rainwater harvesting is practised mainly to \_\_\_\_\_.  
(A) Purify sea water (B) Increase rainfall  
(C) Recharge the ground water and store water for later use (D) Prevent floods in the ocean
45. Kitchen waste is turned into compost mainly because composting \_\_\_\_\_.  
(A) Makes the waste non-biodegradable (B) Destroys all the nutrients  
(C) Produces plastic (D) Lets decomposers return the nutrients to the soil

### Achievers Section

Q46–Q50 · 3 marks each

46. **Assertion (A):** A thick copper wire has less resistance than a thin one of the same length and material.  
**Reason (R):** The resistance of a wire is inversely proportional to its area of cross-section.
- (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. Three resistors of  $6\ \Omega$ ,  $6\ \Omega$  and  $6\ \Omega$  are connected in parallel. Their combined resistance is \_\_\_\_\_.  
(A)  $2\ \Omega$  (B)  $3\ \Omega$   
(C)  $6\ \Omega$  (D)  $18\ \Omega$
48. A colourless gas released when dilute sulphuric acid is poured on zinc granules burns with a pop sound when a lighted splint is brought near it. The gas and the reaction type are \_\_\_\_\_.  
(A) Carbon dioxide, a decomposition reaction (B) Hydrogen, a displacement reaction  
(C) Oxygen, a combination reaction (D) Sulphur dioxide, a neutralisation reaction
49. Trace the path of a drop of blood from the right ventricle until it reaches the left ventricle.  
(A) Right ventricle  $\rightarrow$  lungs  $\rightarrow$  left atrium  $\rightarrow$  left ventricle (B) Right ventricle  $\rightarrow$  left atrium  $\rightarrow$  lungs  $\rightarrow$  left ventricle  
(C) Right ventricle  $\rightarrow$  body  $\rightarrow$  right atrium  $\rightarrow$  left ventricle (D) Right ventricle  $\rightarrow$  aorta  $\rightarrow$  lungs  $\rightarrow$  left ventricle
50. Consider the three statements below.  
(i) A convex lens always forms a real image.  
(ii) Metals generally lose electrons to form positive ions.  
(iii) Energy flow through a food chain is one-way.  
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

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

## Solutions

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**1. Answer: (C)** 80

Each term is double the one before it, so the next term is  $40 \times 2 = 80$ .

**2. Answer: (D)** NOP

Each group holds three consecutive letters, and the groups start four letters apart: B, F, J, **N**. So the next group is **NOP**.

**3. Answer: (B)** 26

$C + A + T = 3 + 1 + 20 = 24$ , so the code adds the letter positions. For DOG:  $4 + 15 + 7 = 26$ .

**4. Answer: (A)** Graphite

Copper, silver and gold are metals. **Graphite** is a form of carbon, a non-metal, though it does conduct electricity — which is exactly why it is the tempting distractor here.

**5. Answer: (D)** Potential difference

An ammeter measures current, so the analogy asks what a voltmeter measures, which is **potential difference**. Resistance is measured with an ohmmeter.

**6. Answer: (A)** 13 km

The two legs are perpendicular, so the distance is  $\sqrt{5^2 + 12^2} = \sqrt{169} = 13$  km.

**7. Answer: (C)** Daughter

C is D's son, and B is C's sister, so B is also a child of D. Being female, B is D's **daughter**.

**8. Answer: (B)** 36

Total =  $12 + 25 - 1 = 36$ , subtracting 1 so that Anita is not counted twice.

**9. Answer: (C)** Both weigh the same

Both have the same mass of one kilogram, so **both weigh the same**. The iron merely occupies far less space, because its density is much greater.

**10. Answer: (D)** Clockwise

Meshed gears always turn in opposite senses. A clockwise turns B anticlockwise, and B anticlockwise turns C **clockwise** again. With an odd number of gears the last one always matches the first.

**11. Answer: (B)**  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

Each side must carry the same number of atoms of every element.  **$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$**  gives 2 magnesium and 2 oxygen atoms on both sides.

**12. Answer: (A)** Carbon dioxide

An acid reacting with a carbonate always gives a salt, water and **carbon dioxide**. The milkiness in lime water comes from insoluble calcium carbonate forming.

**13. Answer: (C)** 1.5

Gastric juice contains hydrochloric acid, so its pH is roughly **1.5** — strongly acidic. This acidity activates pepsin and kills many swallowed microbes.

**14. Answer: (D)** Basic

Metal oxides are usually **basic**, and the soluble ones dissolve to give alkalis, as calcium oxide does. Non-metal oxides, by contrast, are generally acidic.

**15. Answer: (A)** Aluminium

Only a metal above iron in the reactivity series can displace it, and of those listed only **aluminium** qualifies. Copper, silver and gold all lie below iron.

**16. Answer: (B)** Carbon

Adding a little **carbon** to iron gives steel, which is far harder and stronger than pure iron. Adding chromium and nickel as well gives stainless steel.

**17. Answer: (C)**  $C_nH_{2n+2}$

Alkanes are saturated hydrocarbons with the formula  $C_nH_{2n+2}$ , as in  $CH_4$ ,  $C_2H_6$  and  $C_3H_8$ . The formula  $C_nH_{2n}$  belongs to the alkenes.

**18. Answer: (D)** Do not form an insoluble scum with calcium and magnesium salts

Soap reacts with the calcium and magnesium ions of hard water to give a sticky scum, wasting the soap. Detergents form soluble products instead, so they **do not produce scum** and lather freely even in hard water.

**19. Answer: (A)** Carbon dioxide and water

Using sunlight trapped by chlorophyll, a plant combines **carbon dioxide and water** to make glucose, releasing oxygen. Oxygen and glucose are products of the process, not raw materials.

**20. Answer: (B)** Guard cells

Two bean-shaped **guard cells** flank each stoma. When they swell with water the pore opens, and when they lose water it closes, which limits water loss on a hot day.

**21. Answer: (C)** Platelets

**Platelets** gather at a wound and set off the chain of reactions that forms a clot, sealing the cut and stopping the bleeding.

**22. Answer: (D)** Glomerulus

Blood is forced through the fine capillary tuft of the **glomerulus** under pressure, so water, salts, glucose and urea pass into the tubule. Useful substances are then reabsorbed further along.

**23. Answer: (A)** Thyroxine

The thyroid gland needs iodine to make **thyroxine**, which regulates the body's metabolism. A prolonged shortage causes the swelling of the gland known as goitre, which is why iodised salt is recommended.

**24. Answer: (B)** Cross-pollination

Pollen reaching a different plant gives **cross-pollination**, which mixes the genetic material of two individuals and so increases variation. Fertilisation is the later fusion of the gametes.

**25. Answer: (C)** Dominant

The **dominant** trait shows itself whenever its allele is present, so it is the one seen in the  $F_1$  generation. The recessive trait reappears in a quarter of the  $F_2$  plants.

**26. Answer: (D)** Show what organisms of the past were like and when they lived

Fossils are the preserved remains or traces of organisms from the past, and their position in the rock layers indicates their age. They therefore **reveal what earlier organisms looked like and when they lived**, tracing the path of evolution.

**27. Answer: (A)** Converging

A concave mirror brings parallel rays together at its focus, so it is a **converging** mirror. A convex mirror spreads them out and is diverging.

**28. Answer: (B)** Towards the normal

Glass is optically denser than air, so light slows down on entering it and bends **towards the normal**. On leaving the glass it speeds up and bends away from the normal.

**29. Answer: (B)** Dioptres

Power is the reciprocal of the focal length in metres, and its unit is the **diopetre** (D). The watt measures the quite different quantity of energy per second.

**30. Answer: (C)** 3 A

By Ohm's law,  $I = \frac{V}{R} = \frac{12}{4} = 3 \text{ A}$ .

**31. Answer: (D)** Each appliance then gets the full supply voltage and can be switched on or off independently

In parallel every appliance receives the full 220 V, and switching one off does not break the path for the others. In series a single failure would stop everything and each device would receive only part of the voltage.

**32. Answer: (A)** Bar magnet

Inside a solenoid the field is nearly uniform, and outside it emerges from one end and returns to the other, exactly like a **bar magnet** with a north and a south pole.

**33. Answer: (B)** Electromagnetic induction

Moving a coil in a magnetic field changes the magnetic field through it and so induces a current — **electromagnetic induction**, discovered by Faraday. Mechanical energy is thereby converted into electrical energy.

**34. Answer: (C)** Chlorofluorocarbons (CFCs)

**CFCs**, once used in refrigerators and aerosol sprays, drift up to the stratosphere where ultraviolet light frees chlorine atoms that destroy ozone. Their manufacture has been curtailed under international agreement.

**35. Answer: (D)** Third

Counting from the producer: grass is the first level, the grasshopper the second and the frog the **third**. The snake, a secondary carnivore, occupies the fourth.

**36. Answer: (A)** 2 kWh

Energy = power × time = 1 kW × 2 h = **2 kWh**, that is 2 units on the electricity bill.

**37. Answer: (B)** 12 Ω

By Ohm's law,  $R = \frac{V}{I} = \frac{6}{0.5} = \mathbf{12\ \Omega}$ .

**38. Answer: (C)** -50 cm, concave

Since  $P = \frac{1}{f}$  with f in metres,  $f = \frac{1}{-2} = -0.5\text{ m} = \mathbf{-50\text{ cm}}$ . A negative power and focal length mean the lens is **concave**, that is diverging.

**39. Answer: (D)** 3

Magnification is the ratio of the image height to the object height:  $\frac{12}{4} = \mathbf{3}$ , so the image is three times as large.

**40. Answer: (D)** 10

Turning red litmus blue is the test for a base, so the pH must be above 7. Of the values offered, only **10** qualifies.

**41. Answer: (C)** (C)

Rancidity is the spoiling of fats and oils on oxidation, which gives food a bad smell and taste; rust forming on iron is corrosion. So row **(C)** is wrong, while the other three are correctly defined.

**42. Answer: (A)** Keeps glowing at the same brightness

In a parallel circuit each lamp has its own complete path to the cell and receives the full voltage. So if one fails the other **keeps glowing just as before** — the reason household lighting is wired in parallel.

**43. Answer: (B)** Convert a much larger share of the electrical energy into light

A filament bulb wastes most of its energy as heat, while an LED **turns a far larger share of the electricity into light**. It therefore gives the same brightness for a fraction of the power, and lasts much longer.

**44. Answer: (C)** Recharge the ground water and store water for later use

Collecting rain from roofs and open ground lets it soak back into the earth or be stored in tanks, so it **recharges the ground water and provides a supply for the dry months**. It cannot influence how much rain actually falls.

**45. Answer: (D)** Lets decomposers return the nutrients to the soil

Bacteria and fungi break the waste down into simple substances that enrich the soil, so composting **returns nutrients to the soil** and cuts the amount of rubbish sent for disposal.

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

Resistance is given by  $R = \frac{\rho l}{A}$ , so a larger cross-section gives a smaller resistance, just as a wider pipe offers less opposition to flowing water. Both statements are true and the second is exactly **why** the first holds, so R explains A.

**47. Answer: (A)**  $2\ \Omega$

For resistors in parallel,  $\frac{1}{R} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$ , so  $R = 2\ \Omega$ . In general  $n$  equal resistors in parallel give  $\frac{R}{n}$ .

**48. Answer: (B)** Hydrogen, a displacement reaction

The pop test identifies **hydrogen**. Zinc, being more reactive, pushes hydrogen out of the acid:  $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$ , which is a **displacement** reaction.

**49. Answer: (A)** Right ventricle  $\rightarrow$  lungs  $\rightarrow$  left atrium  $\rightarrow$  left ventricle

The right ventricle pumps deoxygenated blood through the pulmonary artery to the **lungs**, where it takes up oxygen. It returns by the pulmonary veins to the **left atrium** and passes down into the **left ventricle**, ready to be pumped to the body.

**50. Answer: (B)** (ii) and (iii) only

Statement (i) is false: an object placed between the lens and its focus gives a virtual, erect, magnified image — the magnifying glass. Statement (ii) is true, since metals have few valence electrons and part with them readily. Statement (iii) is true, because energy passes from producers to consumers and is lost as heat, never returning. So **(ii) and (iii)** hold.