

Full Practice Exam — Set 3

Science · Class 10 · Full Syllabus Practice Exam

TIME 60 minutes	QUESTIONS 50	TOTAL MARKS 60	MAX. SCORE ___ / 60
--------------------	-----------------	-------------------	------------------------

Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

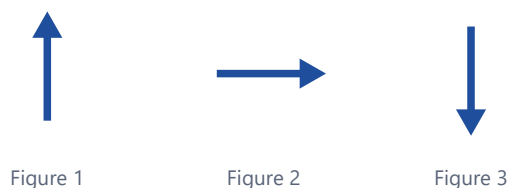
- There are **50 questions** in this paper. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–45 carry **1 mark** each. Questions 46–50 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Study 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? 1, 4, 9, 16, 25, ____
 (A) 30 (B) 35
 (C) 36 (D) 49
- What comes next in the series? AB, DE, GH, ____
 (A) IJ (B) JK
 (C) JL (D) KL
- In a code every vowel in a word is replaced by the vowel that follows it (a→e, e→i, i→o, o→u, u→a). If CAT becomes CET, what does DOG become?
 (A) DAG (B) DIG
 (C) DEG (D) DUG
- Find the **odd one out**: Mercury, Venus, Earth, Moon
 (A) Mercury (B) Moon
 (C) Earth (D) Venus
- Complete the analogy: Chlorophyll : Plant :: Haemoglobin : ____
 (A) Bone (B) Skin
 (C) Nerve (D) Blood
- A girl facing east turns through 180° and then makes a quarter turn to her left. Which direction is she facing now?
 (A) South (B) North
 (C) East (D) West
- M is the son of N. N is the sister of O, and P is the mother of O. How is M related to P?
 (A) Son (B) Grandson
 (C) Nephew (D) Brother

8. A tap can fill a tank in 6 hours and a second tap can fill it in 3 hours. Working together, they will fill it in _____.
- (A) 1.5 hours (B) 9 hours
(C) 4.5 hours (D) 2 hours
9. In a class of 40 students, Meena is 15th from the top. If two students above her leave the class, what is her new rank from the top?
- (A) 13th (B) 12th
(C) 14th (D) 15th
10. The arrows below form a series. Which way will the next arrow point?



A series of arrows: Figure 1, Figure 2 and Figure 3

- (A) Up (B) Left
(C) Down (D) Right

Section 2 — Science

Q11–Q35 · 1 mark each

11. Which of the following is a **combination** reaction?
- (A) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$ (B) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
(C) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$ (D) $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$
12. In the reaction $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$, the substance that is **reduced** is _____.
- (A) Cu (B) H_2
(C) CuO (D) H_2O
13. An aqueous solution of sodium chloride is _____.
- (A) Acidic (B) Basic
(C) Amphoteric (D) Neutral
14. Bleaching powder is used in water works mainly to _____.
- (A) Disinfect the water (B) Soften the water
(C) Increase the pH sharply (D) Add minerals to the water
15. Which metal reacts most vigorously with cold water?
- (A) Magnesium (B) Sodium
(C) Zinc (D) Iron
16. Ionic compounds conduct electricity when _____.
- (A) Cooled below 0°C (B) In the solid state
(C) Molten or dissolved in water (D) Under high pressure only
17. Diamond and graphite are both made of carbon atoms only. They are _____.
- (A) Compounds (B) Isotopes
(C) Isomers (D) Allotropes

18. The functional group -COOH belongs to the _____.
(A) Carboxylic acids (B) Alcohols
(C) Aldehydes (D) Ketones
19. The enzyme present in human saliva is _____.
(A) Pepsin (B) Salivary amylase
(C) Trypsin (D) Lipase
20. The digestion of food is completed in the _____.
(A) Mouth (B) Stomach
(C) Small intestine (D) Large intestine
21. The inner surface of the small intestine bears finger-like projections called villi, whose purpose is to _____.
(A) Store undigested food (B) Grind the food
(C) Secrete hydrochloric acid (D) Increase the surface area for absorption
22. Blood leaving the right ventricle of the human heart travels to the _____.
(A) Lungs, through the pulmonary artery (B) Body, through the aorta
(C) Left atrium, directly (D) Kidneys, through the renal vein
23. In a healthy person, the glucose filtered by the kidney is _____.
(A) Passed out entirely in the urine (B) Completely reabsorbed into the blood
(C) Converted into urea (D) Stored in the bladder
24. The part of the human brain that maintains posture and balance is the _____.
(A) Cerebrum (B) Medulla
(C) Cerebellum (D) Spinal cord
25. *Rhizopus*, the bread mould, reproduces by _____.
(A) Regeneration (B) Binary fission
(C) Budding (D) Spore formation
26. The theory of evolution by natural selection was proposed by _____.
(A) Charles Darwin (B) Gregor Mendel
(C) Louis Pasteur (D) Robert Hooke
27. The image in a plane mirror shows lateral inversion, which means that _____.
(A) The image is upside down (B) The left and right sides appear interchanged
(C) The image is smaller than the object (D) The image is real
28. A torch produces a parallel beam of light when its bulb is placed _____ of the concave reflector.
(A) Beyond the centre of curvature (B) At the pole
(C) At the focus (D) Between the pole and the focus
29. The electric current in a conductor is defined as _____.
(A) The voltage per unit charge (B) The energy used per unit time
(C) The resistance per unit length (D) The charge flowing per unit time
30. A current-carrying circular coil behaves like _____.
(A) A tiny magnet with a north and a south face (B) An insulator
(C) A resistor with no field (D) A capacitor

31. The fuse used in a circuit carrying 5 A should be rated at _____.
 (A) Exactly 1 A (B) A little above 5 A
 (C) Well below 5 A (D) Any value at all
32. The presence of coliform bacteria in a water sample indicates _____.
 (A) A high oxygen content (B) That the water is safe
 (C) Contamination by sewage (D) The presence of dissolved minerals
33. National parks and wildlife sanctuaries are set up mainly to _____.
 (A) Encourage hunting (B) Increase farmland
 (C) Provide timber for industry (D) Conserve biodiversity by protecting habitats
34. The chief advantage of using a solar cooker is that it _____.
 (A) Uses a renewable source and produces no pollution (B) Cooks faster than a gas stove at night
 (C) Needs no sunlight (D) Produces electricity as well
35. Excessive use of nitrogen fertilisers can harm a nearby lake because the run-off _____.
 (A) Freezes the water (B) Causes algae to grow rapidly, and their decay uses up the dissolved oxygen
 (C) Increases the oxygen in the water (D) Makes the water strongly acidic at once

Section 2 — Science (contd.)

Q36–Q45 · 1 mark each

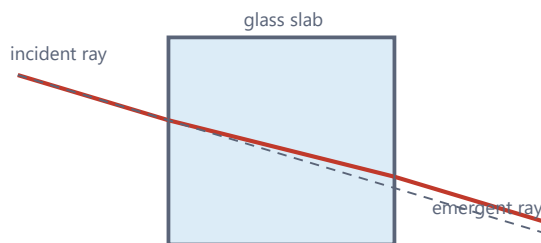
36. A charge of 30 C flows through a wire in 10 seconds. The current is _____.
 (A) 0.33 A (B) 30 A
 (C) 3 A (D) 300 A
37. An object is placed 20 cm in front of a concave mirror of focal length 10 cm. The image is formed _____.
 (A) At infinity (B) 10 cm behind the mirror, magnified
 (C) At the focus, diminished (D) 20 cm in front of the mirror, the same size as the object
38. A bulb is marked 60 W, 220 V. The current it draws in normal use is about _____.
 (A) 0.27 A (B) 3.7 A
 (C) 13 A (D) 60 A
39. The molecular formula of ethanoic acid is _____.
 (A) CH_3OH (B) CH_3COOH
 (C) C_2H_6 (D) $\text{C}_2\text{H}_5\text{OH}$
40. One row of the table below is **incorrectly** matched. Which row is it?

Row	Instrument or device	Use
(A)	Ammeter	Measures current, connected in series
(B)	Voltmeter	Measures potential difference, connected in parallel
(C)	Rheostat	Varies the current by changing the resistance
(D)	Fuse	Increases the current in a circuit

Table 3.1 — Electrical devices and their uses

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

41. In the ray diagram, light passes from air into a glass slab and out again. Which statement describes the emerging ray?



A ray of light passing through a rectangular glass slab

- (A) It travels back along the incident ray
(B) It is perpendicular to the incident ray
(C) It is parallel to the incident ray but shifted sideways
(D) It is absorbed inside the glass
42. Copper vessels develop a green coating when left exposed to moist air. The green substance is _____.
(A) Iron oxide
(B) Pure copper
(C) Copper sulphate
(D) Basic copper carbonate
43. A farmer wants to raise a crop identical to a high-yielding parent plant. The best method is _____.
(A) Vegetative propagation from the parent plant
(B) Sowing seeds from the parent plant
(C) Cross-pollinating with another variety
(D) Grafting on to an unrelated species
44. The use of a lead-acid battery in a car is an example of _____.
(A) Electrical energy being converted into light
(B) Chemical energy being converted into electrical energy
(C) Mechanical energy being converted into heat
(D) Nuclear energy being converted into electrical energy
45. The Chipko movement is remembered for _____.
(A) Setting up a fertiliser factory
(B) Building a large dam
(C) Villagers protecting trees from being felled
(D) Introducing a new crop variety

Achievers Section

Q46–Q50 · 3 marks each

46. **Assertion (A):** The sun can still be seen for a few minutes after it has actually set below the horizon.
Reason (R): Light from the sun is bent by the earth's atmosphere, whose density changes with height.
(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. An electric heater draws 5 A from a 220 V supply. If it is used for 3 hours a day, the energy consumed in a day is about _____.
(A) 1.1 kWh
(B) 11 kWh
(C) 6.6 kWh
(D) 3.3 kWh
48. A student adds a few drops of a colourless liquid to blue litmus solution and it stays blue; adding the same liquid to red litmus turns it blue. The liquid also reacts with an oil to give soap. The liquid is most likely _____.
(A) Sodium hydroxide solution
(B) Dilute hydrochloric acid
(C) Common salt solution
(D) Ethanoic acid

49. Why does a person breathe faster while running, and what happens if the oxygen supply still falls short?
- | | |
|--|--|
| (A) Muscles need less energy, so breathing merely cools the body | (B) Muscles need more energy, so more oxygen is taken in; if it falls short, lactic acid forms and causes cramps |
| (C) The lungs stop working and the heart takes over gas exchange | (D) Carbon dioxide is converted into oxygen in the muscles |

50. Consider the three statements below.

- (i) A voltmeter is connected in parallel with the component whose potential difference is being measured.
- (ii) In a homologous series, all the members have the same molecular formula.
- (iii) Arteries carry blood away from the heart.

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

Solutions

1. Answer: (C) 36

The terms are the squares $1^2, 2^2, 3^2, 4^2, 5^2$, so the next is $6^2 = 36$.

2. Answer: (B) JK

Each pair holds two consecutive letters, and the pairs start three letters apart: A, D, G, **J**. So the next pair is **JK**.

3. Answer: (D) DUG

The only vowel in DOG is O, and O is replaced by U. The consonants are unchanged, so DOG becomes **DUG**.

4. Answer: (B) Moon

Mercury, Venus and Earth are planets orbiting the sun. The **Moon** is a natural satellite, orbiting a planet rather than the sun.

5. Answer: (D) Blood

Chlorophyll is the pigment of green plants, so the analogy asks where haemoglobin is found, which is in the red cells of the **blood**.

6. Answer: (A) South

Turning 180° from east leaves her facing west. Facing west, her left hand points south, so a quarter turn to the left leaves her facing **south**.

7. Answer: (B) Grandson

P is the mother of O, and N is O's sister, so P is also N's mother. M is N's son, which makes him P's **grandson**.

8. Answer: (D) 2 hours

In one hour the first tap fills $\frac{1}{6}$ of the tank and the second $\frac{1}{3}$, so together they fill $\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$ of it. Filling the whole tank therefore takes **2 hours**.

9. Answer: (A) 13th

Two of the fourteen students ahead of her have gone, leaving twelve above her. Her new rank is therefore **13th** from the top.

10. Answer: (B) Left

The arrow turns a quarter circle clockwise each time: up, right, down. The next quarter turn points it to the **left**, after which the pattern repeats.

11. Answer: (A) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$

Two substances join to give a single product in $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$, which is a combination reaction and also strongly exothermic. The others are decomposition, displacement and double displacement respectively.

12. Answer: (C) CuO

CuO loses its oxygen, so it is reduced to copper, while the hydrogen gains oxygen and is oxidised to water. Oxidation and reduction always occur together.

13. Answer: (D) Neutral

Sodium chloride comes from a strong acid and a strong base, neither of which leaves an excess, so its solution is **neutral** with a pH of 7.

14. Answer: (A) Disinfect the water

Bleaching powder releases chlorine, which kills bacteria, so it is used to **disinfect drinking water**. It also bleaches cotton and paper in industry.

15. Answer: (B) Sodium

Sodium reacts so violently with cold water that the hydrogen released may catch fire, which is why it is stored under kerosene. Magnesium needs hot water and iron only steam.

16. Answer: (C) Molten or dissolved in water

Conduction needs ions free to move. In the solid the ions are locked in the lattice, but **melting or dissolving** frees them, so the compound then conducts.

17. Answer: (D) Allotropes

Different forms of the same element in the same physical state are **allotropes**. Their properties differ so greatly because the atoms are bonded in different arrangements.

18. Answer: (A) Carboxylic acids

–COOH is the carboxyl group, which marks the **carboxylic acids**, such as ethanoic acid. Alcohols carry –OH instead.

19. Answer: (B) Salivary amylase

Salivary amylase begins the digestion of starch in the mouth, turning it into sugar. Pepsin works on protein in the stomach and lipase on fat in the small intestine.

20. Answer: (C) Small intestine

The **small intestine** receives bile and pancreatic juice and secretes its own enzymes, so carbohydrates, proteins and fats are all broken down completely there, and the products are absorbed.

21. Answer: (D) Increase the surface area for absorption

Millions of villi, each richly supplied with blood vessels, greatly **increase the surface available for absorption**, so the digested food passes into the blood quickly.

22. Answer: (A) Lungs, through the pulmonary artery

The right ventricle sends deoxygenated blood to the **lungs through the pulmonary artery**, the one artery that carries deoxygenated blood. The aorta leaves the left ventricle instead.

23. Answer: (B) Completely reabsorbed into the blood

Glucose is far too valuable to lose, so it is **reabsorbed completely** in the tubule of the nephron. Glucose in the urine is a sign of diabetes.

24. Answer: (C) Cerebellum

The **cerebellum** coordinates precise voluntary movements and keeps the body balanced — which is what lets a person ride a bicycle or walk in a straight line.

25. Answer: (D) Spore formation

The knob-like sporangia of *Rhizopus* release hundreds of **spores**, which germinate wherever conditions are moist and warm. Spores survive dry spells with their tough protective coats.

26. Answer: (A) Charles Darwin

Charles Darwin argued that individuals with advantageous variations survive and reproduce more successfully, so those variations spread through the population. Mendel worked out inheritance and Pasteur the germ theory of disease.

27. Answer: (B) The left and right sides appear interchanged

Left and right appear swapped, which is why the word AMBULANCE is painted reversed on the front of the vehicle so that it reads correctly in a driver's mirror. The image is not turned upside down.

28. Answer: (C) At the focus

Rays leaving the **focus** of a concave mirror are reflected parallel to the principal axis, giving the strong straight beam wanted in a torch or a headlight.

29. Answer: (D) The charge flowing per unit time

Current $I = \frac{Q}{t}$, the **charge flowing per unit time**, measured in amperes. One ampere is one coulomb per second.

30. Answer: (A) A tiny magnet with a north and a south face

The field lines pass through the coil in one direction and loop round outside, so the coil **acts as a small magnet**, with one face behaving as a north pole and the other as a south pole.

31. Answer: (B) A little above 5 A

The fuse must carry the normal current without melting yet break the circuit as soon as the current becomes dangerous, so its rating is set **a little above the normal working current**. A much lower rating would blow constantly and a much higher one would never protect the circuit.

32. Answer: (C) Contamination by sewage

Coliform bacteria live in the human intestine, so finding them in water shows **contamination by sewage** and the possible presence of disease-causing organisms. They are used as an indicator because they are easy to detect.

33. Answer: (D) Conserve biodiversity by protecting habitats

Protecting a whole habitat shelters every species living in it, so such reserves **conserve biodiversity**. Hunting and commercial exploitation are precisely what they exclude.

34. Answer: (A) Uses a renewable source and produces no pollution

A solar cooker runs on sunlight, which is **renewable and pollution-free**. Its drawbacks are that it works only in bright sunshine and cooks slowly, so it does not replace a stove entirely.

35. Answer: (B) Causes algae to grow rapidly, and their decay uses up the dissolved oxygen

The extra nutrients trigger an algal bloom, and when the algae die the decomposers consume the dissolved oxygen, suffocating the fish. This chain of events, called eutrophication, is why fertiliser run-off is so damaging.

36. Answer: (C) 3 A

$$\text{Current } I = \frac{Q}{t} = \frac{30}{10} = \mathbf{3 \text{ A.}}$$

37. Answer: (D) 20 cm in front of the mirror, the same size as the object

An object placed at the centre of curvature ($2f = 20 \text{ cm}$) has its image formed at the same point, real, inverted and **the same size**. So the image is 20 cm in front of the mirror.

38. Answer: (A) 0.27 A

$$\text{From } P = VI, I = \frac{P}{V} = \frac{60}{220} = \mathbf{0.27 \text{ A}} \text{ to two decimal places.}$$

39. Answer: (B) CH_3COOH

Ethanoic acid carries the carboxyl group on a two-carbon skeleton: **CH_3COOH** . $\text{C}_2\text{H}_5\text{OH}$ is ethanol, from which it can be made by oxidation.

40. Answer: (D) (D)

A fuse does the opposite: it melts and *breaks* the circuit when the current grows too large. So row **(D)** is wrong, while the other three are correctly described.

41. Answer: (C) It is parallel to the incident ray but shifted sideways

The ray bends towards the normal on entering the denser glass and away from it on leaving, and since the two faces are parallel the two bendings cancel. So the emergent ray is **parallel to the incident ray, merely displaced sideways** — the effect called lateral displacement.

42. Answer: (D) Basic copper carbonate

Moist air containing carbon dioxide slowly attacks copper to form green **basic copper carbonate**. Rubbing the vessel with a sour substance such as tamarind removes it, since the acid dissolves the coating.

43. Answer: (A) Vegetative propagation from the parent plant

Vegetative propagation uses a piece of the parent itself, so every new plant carries exactly the same genes and the desirable quality is preserved. Seeds arise from sexual reproduction and show variation.

44. Answer: (B) Chemical energy being converted into electrical energy

Inside the battery a chemical reaction drives the current, so **chemical energy becomes electrical energy**. When the battery is recharged the conversion runs the other way.

45. Answer: (C) Villagers protecting trees from being felled

In the Chipko movement villagers, mostly women, **hugged the trees to stop contractors from felling them**, showing how local communities can protect forests they depend on.

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

Atmospheric refraction bends sunlight downward as it passes through layers of increasing density, so the sun appears slightly higher than it really is and remains visible for about two minutes after it has set. Both statements are true and the refraction is exactly **why**, so R explains A.

47. Answer: (D) 3.3 kWh

Power $P = VI = 220 \times 5 = 1100 \text{ W} = 1.1 \text{ kW}$. Over 3 hours the energy is $1.1 \times 3 = \mathbf{3.3 \text{ kWh}}$.

48. Answer: (A) Sodium hydroxide solution

Leaving blue litmus unchanged while turning red litmus blue is the test for a base, and a base that gives soap with an oil in saponification points to **sodium hydroxide solution**. An acid would turn blue litmus red, and salt solution would leave both papers unchanged.

49. Answer: (B) Muscles need more energy, so more oxygen is taken in; if it falls short, lactic acid forms and causes cramps

Running raises the muscles' demand for energy, so respiration speeds up and more oxygen must be supplied. If the supply still falls short, the muscles switch to anaerobic respiration, and the **lactic acid** that builds up causes the familiar cramp.

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

Statement (i) is true, since a voltmeter has very high resistance and is bridged across the component. Statement (ii) is false — members of a homologous series share a *general* formula and the same functional group, but each has its own molecular formula. Statement (iii) is true, the pulmonary artery included. So **(i) and (iii)** hold.