CBSE 2025 Science — Set 1

English Medium

Time Allowed: 3 Hours | Maximum Marks: 80

General Instructions:

1. This question paper contains 39 questions. All questions are compulsory.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 6 questions carrying 2 marks each.
4. Section C has 7 questions carrying 3 marks each.
5. Section D has 3 questions carrying 5 marks each.
6. Section E has 3 case-study based questions carrying 4 marks each.
7. Draw neat diagrams wherever required.

Section A

Multiple Choice Questions (1 mark each)

Q.1 [1 mark]

Electrolysis of water is a decomposition reaction. The mass ratio (M_1 : M_2) of hydrogen and oxygen gases liberated at the electrodes during electrolysis of water is:

(a) 8 : 1
(b) 2 : 1
(c) 1 : 2
(d) 1 : 8

Q.2 [1 mark]

The products formed when Aluminium and Magnesium are burnt in the presence of air respectively are:

(a) Al_2O_3 and MgO_2
(b) Al_2O_3 and MgO
(c) Al_2O_4 and MgO
(d) Al_2O_4 and MgO_2

Q.3 [1 mark]

The following table shows the pH values of four solutions A, B, C and D on a pH scale:

A is at pH 2, B is at pH 6, C is at pH 7, D is at pH 13.

The solutions A, B, C and D respectively are of a:

(a) Strong acid, weak acid, neutral, strong base
(b) Weak acid, neutral, weak base, strong base
(c) Weak acid, neutral, strong base, weak base
(d) Weak acid, neutral, strong base, strong acid

Q.4 [1 mark]

Consider the following reactions:

(i) Dilute hydrochloric acid reacts with sodium hydroxide.

(ii) Magnesium oxide reacts with dilute hydrochloric acid.

(iii) Carbon dioxide reacts with sodium hydroxide.

It is found that in each case:

(a) Salt and water is formed.

(b) Neutral salts are formed.

(c) Hydrogen gas is formed.

(d) Acidic salts are formed.

Q.5 [1 mark]

Reaction between two elements A and B forms a compound C. A loses electrons and B gains electrons. Which one of the following properties will not be shown by compound C?

(a) It has high melting point.

(b) It is highly soluble in water.

(c) It has weak electrostatic forces of attraction between its oppositely charged ions.

(d) It conducts electricity in its molten state or aqueous solution.

Q.6 [1 mark]

The metals obtained from their molten chlorides by the process of electrolytic reduction are:

(a) Gold and silver

(b) Calcium and magnesium

(c) Aluminium and silver

(d) Sodium and iron

Q.7 [1 mark]

The formation of magnesium oxide is correctly shown in option:

(a) Mg transfers 2 electrons to O, forming Mg^{2+} and O^{2-} (MgO)
(b) Mg transfers 1 electron to O, forming Mg^{+} and O^{-}
(c) Mg transfers 2 electrons to 2 O atoms, forming Mg^{2+} and $(O^{-})_2$
(d) 2Mg transfers electrons to O_2, forming $[Mg^{2+}]_2[O^{2-}]_2$

Q.8 [1 mark]

Secretion of less saliva in mouth will effect the conversion of:

(a) proteins into amino acids
(b) fats into fatty acids and glycerol
(c) starch into simple sugars
(d) sugars into alcohol

Q.9 [1 mark]

The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is:

(a) Cytokinins
(b) Gibberellins
(c) Adrenaline
(d) Auxins

Q.10 [1 mark]

The correct true statement(s) for a bisexual flower is/are:
(i) They possess both stamen and pistil.
(ii) They possess either stamen or pistil.
(iii) They exhibit either self-pollination or cross-pollination.
(iv) They cannot produce fruits on their own.

(a) (i) only
(b) (iv) only
(c) (i) and (iii)
(d) (i) and (iv)

Q.11 [1 mark]

If pea plants with round and green seeds (RRyy) are crossed with pea plants having wrinkled and yellow seeds (rrYY), the seeds developed by the plants of F_1 generation will be:

(a) 100% round and green
(b) 100% round and yellow
(c) 75% wrinkled and green
(d) 75% wrinkled and yellow

Q.12 [1 mark]

The breakdown of glucose has taken the following pathway:
Glucose →(a) Pyruvate + Energy →(b) Lactic acid + Energy
The sites 'a' and 'b' respectively are:

(a) Mitochondria and Oxygen deficient muscle cells
(b) Cytoplasm and Oxygen rich muscle cells
(c) Cytoplasm and Yeast cells
(d) Cytoplasm and Oxygen deficient muscle cells

Q.13 [1 mark]

Mirror 'X' is used to concentrate sunlight in solar furnace and Mirror 'Y' is fitted on the side of the vehicle to see the traffic behind the driver. Which of the following statements are true for the two mirrors?
(i) The image formed by mirror 'X' is real, diminished and at its focus.
(ii) The image formed by mirror 'Y' is virtual, diminished and erect.
(iii) The image formed by mirror 'X' is virtual, diminished and erect.
(iv) The image formed by mirror 'Y' is real, diminished and at its focus.

(a) (i) and (ii)
(b) (iii) and (iv)
(c) (ii) and (iii)
(d) (i) and (iv)

Q.14 [1 mark]

An old person is suffering from an eye defect caused by weakening of ciliary muscles and diminishing flexibility of the eye lens. If the defect of vision is 'a' which can be corrected by lens 'b', then 'a' and 'b' respectively are:

(a) hypermetropia and convex lens
(b) presbyopia and bifocal lens
(c) myopia and concave lens
(d) myopia and bifocal lens

Q.15 [1 mark]

Which of the following groups do not constitute a food chain?

(a) Grass, wheat, mango, peepal
(b) Grass, snake, grasshopper, fish
(c) Hawk, grass, snake, grasshopper, frog
(d) Grass, snake, wolf, tiger

Q.16 [1 mark]

The percentage of solar energy which is not converted into food energy by the leaves of green plants in a terrestrial ecosystem is about:

(a) 1%
(b) 10%
(c) 90%
(d) 99%

Q.17 [1 mark]

Assertion (A): Decomposition reactions are generally endothermic reactions.
Reason (R): Decomposition of organic matter into compost is an exothermic process.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the

correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

Q.18 [1 mark]

Assertion (A): A human child bears all the basic features of human beings.

Reason (R): It looks exactly like its parents, showing very little variations.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

Q.19 [1 mark]

Assertion (A): No two magnetic field lines are found to cross each other.

Reason (R): The compass needle cannot point towards two directions at the point of intersection of two magnetic field lines.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

Q.20 [1 mark]

Assertion (A): The amount of ozone in the atmosphere began to drop sharply in the 1980s.

Reason (R): The oxygen atoms combine with molecular oxygen to form ozone.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the

correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

Section B

Very Short Answer Questions (2 marks each)

Q.21 [2 marks]

A student performs the following experiment in his school laboratory: Dilute sulphuric acid is added to zinc granules in a test tube. List two observations to justify that in this experiment a chemical change has taken place.

Q.22 [2 marks]

Draw labelled diagrams to show different stages of budding in Hydra.

Q.23 [2 marks]

(a) Besides minimizing the loss of blood, why is it essential to plug any leak in a blood vessel? Name the component of blood which helps in this process and state how this component performs this function.

OR

(b) (i) The transport system in plants is relatively slower than in animals. Give reasons.

(ii) State the role of phloem in the transport of materials in plants.

OR

Q.23 [2 marks]

(b) (i) The transport system in plants is relatively slower than in animals.

Give reasons.

(ii) State the role of phloem in the transport of materials in plants.

Q.24 [2 marks]

An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm. Use lens formula to find the position of the image formed in this case.

Q.25 [2 marks]

(a) A wire of resistance R is cut into three equal parts. If these three parts are then joined in parallel, calculate the total resistance of the combination so formed.

OR

(b) Define electric power. When do we say that the power consumed in an electric circuit is 1 Watt?

OR

Q.25 [2 marks]

Define electric power. When do we say that the power consumed in an electric circuit is 1 Watt?

Q.26 [2 marks]

"Excessive use of chemicals and pesticides in agriculture adversely affect the environment." Justify this statement.

Section C

Short Answer Questions (3 marks each)

Q.27 [3 marks]

(a) "Displacement reactions also play a key role in extracting metals in the middle of the reactivity series." Justify this statement with two examples.

(b) Why can metals high up in the reactivity series not be obtained by reduction of their oxides by carbon?

Q.28 [3 marks]

(a) With the help of an activity, explain the conditions under which iron articles get rusted.

OR

(b) (i) Name two metals which react violently with cold water. List any three observations which a student notes when these metals are dropped in a beaker containing water.

(ii) Write a test to identify the gas evolved (if any) during the reaction of these metals with water.

OR

Q.28 [3 marks]

(b) (i) Name two metals which react violently with cold water. List any three observations which a student notes when these metals are dropped in a beaker containing water.

(ii) Write a test to identify the gas evolved (if any) during the reaction of these metals with water.

Q.29 [3 marks]

Plants have neither a nervous system nor muscles, even then they respond to stimuli. For example, the leaves of chhui-mui (touch-me-not) plant when touched begin to fold up and droop.

(a) How is the information communicated in 'touch-me-not' plants?

(b) What enables the plant cells to bring out the observable response?

(c) Differentiate the movement mentioned above from the movement of tendrils in a pea plant.

Q.30 [3 marks]

(a) What are chromosomes?

(b) Explain in brief how stability of DNA of a species is ensured in sexually reproducing organisms.

Q.31 [3 marks]

Draw ray diagrams to show the nature, position and relative size of the image formed by a convex mirror when the object is placed (i) at infinity and (ii) between pole P and infinity of the mirror.

Q.32 [3 marks]

Consider the following electric circuit with a 15V source, resistors of 10Ω and 15Ω in parallel, connected in series with 60Ω and 40Ω in series, with an ammeter. Calculate the values of the following:

(a) The total resistance of the circuit.

(b) The total current drawn from the source.

(c) Potential difference across the parallel combination of 10Ω and 15Ω resistors.

Q.33 [3 marks]

(a) Write the relationship between resistivity and resistance of a cylindrical conductor of length l and area of cross-section A. Hence derive the SI unit of resistivity.

(b) Why are alloys used in electrical heating devices?

Section D

Long Answer Questions (5 marks each)

Q.34 [5 marks]

(a) (i) Draw two isomeric structures of Butene (C_4H_8).

(ii) Name the following compounds:

(I) H–C–C–C–Cl (with H atoms: 1-chloropropane structure)

(II) H–C–C–C–C–H with an oxygen double bond (butanone/butanal structure)

(iii) Write the chemical equations for the following reactions. Mention one essential condition each for these reactions to take place:

(I) Ethanol undergoes complete oxidation

(II) Propene undergoes hydrogenation

(III) Ethanoic acid reacts with ethanol

OR

(b) (i) A carbon compound X is a good solvent. On reaction with sodium, X forms two products Y and Z. Z is used to convert vegetable oil into vegetable ghee. Identify and name X, Y and Z. Also write the equation of reaction of X with sodium to justify your answer.

OR

Q.34 [5 marks]

(b) (i) A carbon compound X is a good solvent. On reaction with sodium, X forms two products Y and Z. Z is used to convert vegetable oil into vegetable ghee. Identify and name X, Y and Z. Also write the equation of reaction of X with sodium to justify your answer.

(ii) Write chemical equations to show what happens when ethanol:

(I) burns in oxygen/air.

(II) is heated at 443 K in excess conc. H_2SO_4.

(III) reacts with acidified potassium dichromate.

Q.35 [5 marks]

(a) (i) Write the functions of the following parts of human female reproductive system:

(I) Ovary

(II) Fallopian tube

(III) Uterus

(ii) State briefly two contraceptive methods used by human males.

OR

(b) (i) Differentiate between self-pollination and cross-pollination.

(ii) Identify A, B and C in the diagram of a flower given below and write one function of each.

OR

Q.35 [5 marks]

(b) (i) Differentiate between self-pollination and cross-pollination.

(ii) Identify A, B and C in the diagram of a flower given below and write one function of each. (A = Stigma, B = Style, C = Ovule)

Q.36 [5 marks]

(a) (i) A lens 'X' has power -2.5 D. Name the lens and determine its focal length in cm. For which eye defect of vision will an optician prescribe this type of lens as a corrective lens?

(ii) The value of magnification 'm' for a lens is -2. Using new Cartesian sign convention and considering that an object is placed at a distance of 20 cm from the optical centre of this lens, state:

(I) the nature of the image formed;

(II) size of the image compared to the size of the object;

(III) position of the image; and

(IV) sign of the height of the image.

(iii) The numerical values of the focal lengths of two lenses A and B are respectively 10 cm and 20 cm. Which one of the two will show higher degree of convergence/divergence? Give reason to justify your answer.

OR

(b) (i) Draw a ray diagram to show the refraction of a ray of light through a rectangular glass slab when it falls obliquely from air into glass.
(ii) State Snell's law of refraction of light.
(iii) Differentiate between the virtual images formed by a convex lens and a concave lens on the basis of:
(I) object distance, and
(II) magnification.

OR

Q.36 [5 marks]

(b) (i) Draw a ray diagram to show the refraction of a ray of light through a rectangular glass slab when it falls obliquely from air into glass.
(ii) State Snell's law of refraction of light.
(iii) Differentiate between the virtual images formed by a convex lens and a concave lens on the basis of:
(I) object distance, and
(II) magnification.

Section E

Case Study Based Questions (4 marks each)

Q.37 [4 marks]

Case Study: Seawater contains many salts dissolved in it. Common salt is separated from these salts. Deposits of solid salt are also found in several parts of the world. These large crystals are often brown due to impurities.

This is called rock salt and is mined like coal. The common salt is an important raw material for chemicals of daily use.

Q.37(a) [4 marks]

(Case Study Q37) Write balanced chemical equations to show the products formed during electrolysis of brine.

Q.37(b) [4 marks]

(Case Study Q37) List two uses of any one product obtained during electrolysis of brine.

Q.37(c) [4 marks]

(Case Study Q37) (i) A mild non-corrosive basic salt 'A', used for faster cooking, is strongly heated to produce a compound 'B', that is used for removing permanent hardness of water. Identify A and B and also write the equation for the reaction that occurs when A is heated.

OR

(ii) Define water of crystallisation. Give two examples of salts that have water of crystallisation.

Q.38 [4 marks]

Case Study: The maintenance functions of all living organisms must go on even when they are not doing anything particular. Even when we are just sitting in a class or even asleep, this maintenance job has to go on. These maintenance processes require energy to prevent damage and break-down of cells and tissues, which is obtained by the individual organism from the food prepared by the autotrophs, called producers.

Q.38(a) [4 marks]

(Case Study Q38) Name and define the process by which green plants prepare food.

Q.38(b) [4 marks]

(Case Study Q38) Write chemical equation involved in the above process.

Q.38(c) [4 marks]

(Case Study Q38) (i) State in proper sequence the events that occur in synthesis of food by desert plants.

OR

(iii) Explain giving reasons what happens to the rate at which the green plants will prepare food:
(I) during cloudy weather, and
(II) when stomata get blocked due to dust.

Q.39 [4 marks]

Case Study: In our homes, we receive the supply of electric power through a main supply also called mains, either supported through overhead electric poles or by underground cables. In our country the potential difference between the two wires (live wire and neutral wire) of this supply is 220 V.

Q.39(a) [4 marks]

(Case Study Q39) Write the colours of the insulation of the line wires through which supply comes to our homes.

Q.39(b) [4 marks]

(Case Study Q39) What should be the current rating of the electric circuit (220 V) so that an electric iron of 1 kW power rating can be operated?

Q.39(c) [4 marks]

(Case Study Q39) (i) What is the function of the earth wire? State the advantage of the earth wire in domestic electric appliances such as electric iron.

OR

(ii) List two precautions to be taken to avoid electrical accidents. State how these precautions prevent possible damage to the circuit/appliances.