Vidya Mandir Public School

Half Yearly Examination

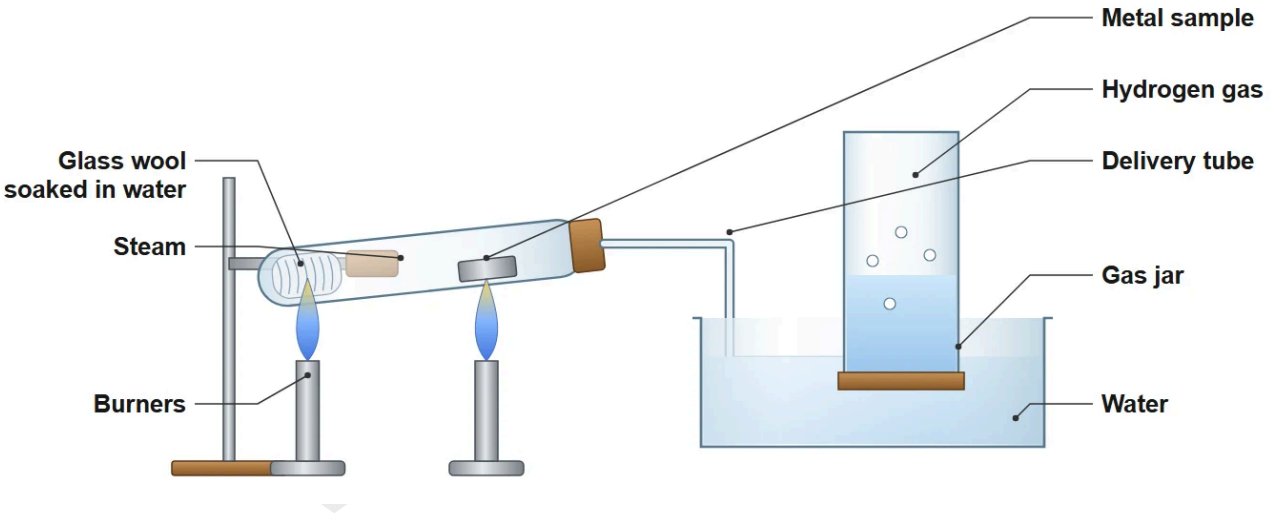
Date: 22 Sep 2026 | **Class X · Science** | Duration: 180 Minutes | Max. Marks: 80

Section A — 1 Mark Questions

Q1. [CBSE 2024] The oxide which can react with HCl as well as KOH to give corresponding salt and water is *(1 Marks)*

(A) CuO
(B) Al_2O_3
(C) Na_2O
(D) K_2O

Q2. In the set-up shown, a metal is heated with steam and the gas is collected over water. If the metal is iron, the products are



(1 Marks)

(A) FeO and H_2
(B) Fe_2O_3 and H_2
(C) Fe_3O_4 and H_2
(D) $Fe(OH)_2$ and H_2

Q3. When adrenaline is secreted during an emergency, the blood supply to the digestive system and skin *(1 Marks)*

(A) increases
(B) stops completely
(C) is reduced, and blood is diverted to the skeletal muscles
(D) is not affected

Q4. [CBSE 2025] Tooth enamel is made up of calcium hydroxyapatite (a crystalline form of calcium phosphate). This chemical starts corroding in the mouth when the pH is : *(1 Marks)*

(A) 7
(B) 5
(C) 10
(D) 14

Q5. [CBSE 2026] Walking in a straight line and riding a bicycle are activities which are possible due to coordination of which part of the brain? *(1 Marks)*

(A) Fore-brain – Cerebrum
(B) Mid-brain – Cerebellum
(C) Hind-brain – Cerebellum
(D) Hind-brain – Medulla

Q6. [CBSE 2023] The name of the salt used to remove permanent hardness of water is: *(1 Marks)*

(A) Sodium hydrogen carbonate ($NaHCO_3$)
(B) Sodium chloride (NaCl)
(C) Sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$)
(D) Calcium sulphate hemihydrate ($CaSO_4 \cdot \frac{1}{2}H_2O$)

Q7. Very fine particles in the air scatter mainly *(1 Marks)*

(A) light of shorter wavelengths (blue)
(B) light of longer wavelengths (red)
(C) all colours equally
(D) no light at all

Q8. [CBSE 2023] Plants which bear unisexual flowers are: *(1 Marks)*

(A) Mustard and Papaya
(B) Hibiscus and Watermelon
(C) Mustard and Hibiscus
(D) Watermelon and Papaya

Q9. Choose the incorrect statement about insulin *(1 Marks)*

(A) It is produced from pancreas
(B) It regulates growth and development of the body
(C) It regulates blood sugar level
(D) Insufficient secretion of insulin will cause diabetes

Q10. [CBSE 2025] The formula of washing soda is *(1 Marks)*

(A) $NaHCO_3 \cdot 6H_2O$
(B) $Na_2CO_3 \cdot 6H_2O$
(C) $NaHCO_3 \cdot 10H_2O$
(D) $Na_2CO_3 \cdot 10H_2O$

Q11. [CBSE 2026] Choose the correct statements with reference to chromosomes :
(i) carry hereditary information from parents to next generation.
(ii) are thread-like structures located inside the nucleus of an animal cell.
(iii) always exist in pairs in human gametes.
(iv) are involved in the process of cell division.
Options : *(1 Marks)*

(A) (i) and (ii)
(B) (iii) and (iv)
(C) (i), (ii) and (iv)
(D) (ii), (iii) and (iv)

Q12. [CBSE 2026] Choose the equation of reaction that correctly represents anaerobic respiration in muscles : *(1 Marks)*

(A) Glucose $\rightarrow$ Pyruvate $\rightarrow$(Absence of O_2) Ethanol + CO_2 + Energy
(B) Glucose $\rightarrow$(O_2) Pyruvate $\rightarrow$(O_2) Energy
(C) Glucose $\rightarrow$(O_2) Pyruvate $\rightarrow$(Lack of oxygen) Ethanol + Energy
(D) Glucose $\rightarrow$ Pyruvate $\rightarrow$(Lack of oxygen) Lactic acid + Energy

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Q13. Which one of the following properties is not generally exhibited by ionic compounds?

(1 Marks)

(A) Solubility in water
(B) Electrical conductivity in solid state
(C) High melting and boiling points
(D) Electrical conductivity in molten state

Q14. In a food chain, the highest concentration of a non-biodegradable pesticide is found in

(1 Marks)

(A) the producers
(B) the herbivores
(C) the top carnivores
(D) the decomposers

Q15. [CBSE 2026] Translocation is the process in which plants deliver : *(1 Marks)*

(A) Minerals from leaves to other parts of the plant.
(B) Plant growth hormones from leaves to other parts of the plant.
(C) Water and inorganic substances from leaves to other parts of the plant.
(D) Organic substances from leaves to the other parts of the plant.

Q16. [CBSE 2024] Select out of the following a gland which does **NOT** occur as a pair in the human body : *(1 Marks)*

(A) Pituitary
(B) Ovary
(C) Testis
(D) Adrenal

Q17. [CBSE 2026] Assertion (A) : Pure ethanoic acid is also known as glacial acetic acid.
Reason (R) : Pure ethanoic acid often freezes during winter due to its low melting point of 290 K.

(1 Marks)

(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.

Q18. Assertion (A): HIV-AIDS is a sexually transmitted disease.
Reason (R): HIV-AIDS is caused by a bacterium. *(1 Marks)*

(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.

Q19. [CBSE 2025] Assertion (A): Silver chloride turns grey in sunlight.
Reason (R): Decomposition of silver chloride into silver and chlorine takes place by sunlight.

(1 Marks)

(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.

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Q20. [CBSE 2020] Two statements are given – one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below.
Assertion (A): Carbon has a strong tendency to either lose or gain electrons to attain noble gas configuration.
Reason (R): Carbon has four electrons in its outermost shell and has the tendency to share electrons with carbon or other elements. *(1 Marks)*

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

Section B — 2 Marks Questions

Q1. [CBSE 2016] To find the image distance for varying object distances in case of a convex lens of focal length 15 cm, a student obtains on a screen a sharp image of a bright object by placing it at 20 cm distance from the lens. After that he gradually moves the object away from the lens and each time focuses the image on the screen.
(a) In which direction-towards or away from the lens does he move the screen to focus the object ?
(b) How does the size of image change ?
(c) Approximately at what distance does he obtain the image of magnification –1 ?
(d) How does the intensity of image change as the object moves farther and farther away from the lens ? *(2 Marks)*

Q2. [CBSE 2025] How is lymph formed ? State its important function. *(2 Marks)*

Q3. [CBSE 2025] (A) State two applications of Joule's heating in domestic electric circuit.
(B) (a) Establish the relationship between the commercial unit of electric energy and the SI unit of electric energy.
OR
(b) Determine the total resistance of the parallel combination of three resistances of 2 Ω, 4 Ω and 6 Ω. *(2 Marks)*

Q4. People use a variety of methods to wash clothes. Usually after adding the soap, they 'beat' the clothes on a stone, or beat it with a paddle, scrub with a brush or the mixture is agitated in a washing machine. Why is agitation necessary to get clean clothes? *(2 Marks)*

Q5. What is a tropic movement? Explain with an example. *(2 Marks)*

Q6. [CBSE 2026] Draw a ray diagram to show the correction of eye defect of an old man who can not see an object placed closer than 1 m from his eye, clearly. *(2 Marks)*

Section C — 3 Marks Questions

Q1. [CBSE 2026] Give reasons:
(i) Metal sulphides and carbonates should be converted to their metal oxides in the process of

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extraction of metals.
(ii) Aluminium oxide is considered as an amphoteric oxide.
(iii) Metals like Na, K, Ca and Mg are never found in their free state in nature. 3×1 *(3 Marks)*

Q2. [CBSE 2020] How is washing soda prepared from sodium carbonate? Give its chemical equation. State the type of this salt. Name the type of hardness of water which can be removed by it? *(3 Marks)*

Q3. [CBSE 2025] State two limitations of electrical impulses in multicellular organisms. Why is chemical communication better than electrical impulses as a means of communication between cells in multicellular organisms? *(3 Marks)*

Q4. [CBSE 2018] (a) List the factors on which the resistance of a conductor in the shape of a wire depends. (b) Why are metals good conductors of electricity whereas glass is a bad conductor of electricity? Give reason. (c) Why are alloys commonly used in electrical heating devices? Give reason. *(3 Marks)*

Q5. [CBSE 2026] The values of current I flowing in a given resistor for the corresponding values of potential difference V applied across the ends of resistor are given below in the table:

I (amperes)	0.4	0.8	1.2	1.6	2.0
V (volts)	1.2	2.4	3.6	4.8	6.0

Plot a graph between V and I and calculate the resistance of that resistor. *(3 Marks)*

Q6. [CBSE 2019] 2 g of ferrous sulphate crystals are heated in a dry boiling tube. (a) List any two observations (b) Name the type of chemical reaction taking place (c) Write balanced chemical equation for the reaction and name the products formed *(3 Marks)*

Q7. [CBSE 2026] What happens when
(i) potassium iodide solution is added to lead (II) nitrate solution ?
(ii) zinc is added to copper (II) chloride solution ?
(iii) hydrogen gas is passed over hot copper (II) oxide ?
Write balanced chemical equations of the reactions involved in support of your answer. [3×1]

(3 Marks)

Section D — 4 Marks Questions

Q1. [CBSE 2026] **Read the following passage and answer the questions given below :**

> *Most of metals occur in combined state in form of ores. Carbonate ores are converted into oxides by calcination and sulphide ores by roasting. Oxides are reduced with suitable reducing agent like carbon to get free metal. Highly reactive metals like – Al, Mg are also used as reducing agents to obtain metal from their oxides. Most reactive metals are obtained by electrolytic reduction of their molten ores. Alloying is a very good method of improving the properties of a metal. We can get desired properties by this method. The electrical conductivity and melting point of an alloy is less than that of pure metals.*

(4 Marks)

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(a) (a) Why carbonate or sulphide ores are converted to oxides before extraction of metal from it ?

(b) (b) Write a reaction in which Aluminium is used as a reducing agent to obtain metal from its oxide.

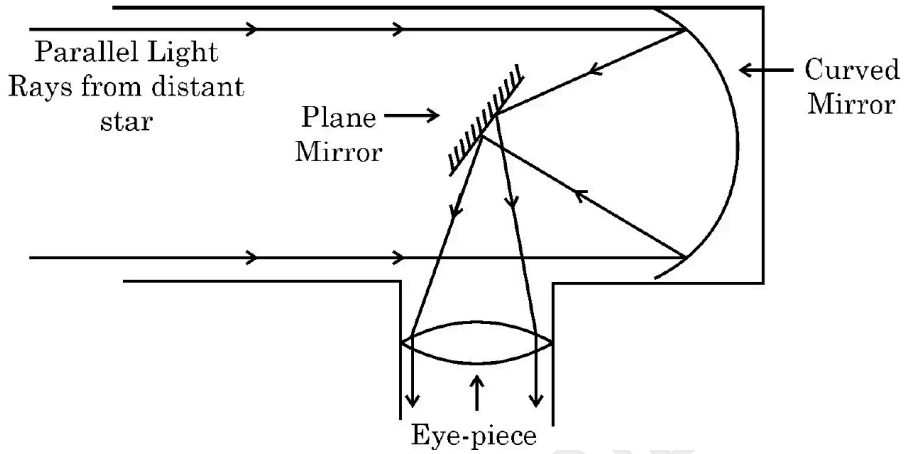
(c) (c) (i) How is copper obtained from its ore (Cu_2S) ? Give equations of the reactions.

OR

(c) (ii) (I) Why highly reactive metals cannot be obtained from their oxides by using carbon as a reducing agent ?

(II) Why solder, an alloy of lead and tin, is used for welding electrical wires together ?

Q2. [CBSE 2026]



The above ray diagram is to show image formation by a reflecting telescope. Reflecting telescope revolutionized our way of looking into the sky. Reflecting telescopes employ large mirrors to gather and focus light rather than relying solely on lenses as we do in the refracting telescopes. These telescopes utilize precisely shaped and polished mirrors to capture incoming light and reflect it to a focal point, where the telescope forms an image for observation. *(4 Marks)*

(a) (a) What kind of image of a star is seen by the observer in the eye-piece ?

(b) (b) What kind of mirror is used in this reflecting telescope ?

(c) (c) Explain with the reason, what kind of optical device (type of lens or mirror) is used at the eye-piece.

OR

(c) What is the role of plane mirror in image formation by this telescope ?

Q3. On a clear day the sky looks blue, while at sunset the Sun and the sky near it look orange-red. Astronauts in space see a dark sky even in daytime. *(4 Marks)*

(a) Which phenomenon explains these observations?

(b) Which colour is scattered most by fine air particles?

(c) (a) Why is the Sun reddish at sunset? OR (b) Why is the sky dark for an astronaut?

Section E — 5 Marks Questions

Q1. [CBSE 2023] (i) Butane had both Carbon – Carbon bonds as well as Carbon – Hydrogen bonds. Draw its structural formula and state the number of (1) C – H bonds and (2) C – C bonds in it.

(ii) You have two carbon compounds with the molecular formula C_3H_6O. Name two compounds with this formula and also draw their structural formula. *(5 Marks)*

Q2. [CBSE 2020] (a) Carry out following conversions :
(i) Ethanol to ethene
(ii) Ethanol to Ethanoic acid
(b) Differentiate between addition reaction and substitution reaction. Give one example of each.
(5 Marks)

Q3. A dry pellet of a common base B, when kept in open absorbs moisture and turns sticky. The compound is also a by-product of chloralkali process. Identify B. What type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution. *(5 Marks)*

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