

Andhra Pradesh — Summative Assessment 1 (SA1), 2026-27
Class X — General Science Paper I — Physical Science
Answer Key — Set 2

For: Model Paper 2

Max. Marks: 50

Notes for valuers

- Value points are given for descriptive answers; accept any answer that covers the same ideas in the student's own words.
- For diagrams: correct diagram 2 marks, labels/arrows 2 marks (4-mark question).

SECTION – I

8 × 1 = 8

1. Combination reaction (also exothermic)
2. B) hydrogen
3. Brass
4. C_3H_8 (propane)
5. $v = c/n = (3 \times 10^8)/1.5 = 2 \times 10^8$ m/s
6. Power of accommodation
7. Symbol of a variable resistor: a resistor (zig-zag line or rectangle) with an arrow drawn across it (or a resistor with a sliding arrow tap).
8. 8Ω (4 + 4)

SECTION – II

3 × 2 = 6

9. Nitrogen is an unreactive (inert) gas.
It keeps oxygen away and prevents the oil/fat in chips from getting oxidised, i.e. it prevents rancidity.
10. Acids show acidic properties only when they release H^+ ions, which happens only in the presence of water.
Dry HCl gas does not ionise, so it gives no H^+ ions and does not change dry litmus.
11. Stars are very far away and act as point sources of light. Due to atmospheric refraction, the apparent position and brightness of a star keep changing, so it twinkles.
Planets are much closer and act as extended sources; the variations from different points average out, so they do not twinkle.

SECTION – III

3 × 4 = 12

12. (A) Ray diagram (convex lens, object between F_1 and $2F_1$):
 - A ray parallel to the principal axis passes through F_2 after refraction.
 - A ray through the optical centre goes undeviated.
 - Image is formed beyond $2F_2$ — real, inverted and magnified.
12. (B) Circuit diagram: battery (cells), plug key, resistor (R), ammeter (A) — all in series; voltmeter (V) connected in parallel across the resistor.
Correct symbols, + / – terminals of ammeter and voltmeter, and direction of current to be shown.
13. Any four: [1 each]
 1. Metals are lustrous; non-metals are dull (except iodine).
 2. Metals are malleable and ductile; non-metals are brittle (solid non-metals).

3. Metals are good conductors of heat and electricity; non-metals are poor conductors (except graphite).
4. Metals are sonorous; non-metals are not.
5. Metals are generally hard solids with high melting points (except Na, K, Hg, Ga); non-metals may be solids, liquids or gases.

14. i) Methane (CH₄) and propane (C₃H₈)

[1 each]

ii) Ethene (C₂H₄)

iii) C_nH_{2n}

iv) Ethene and ethyne. They are unsaturated hydrocarbons with a high proportion of carbon, so they do not burn completely and give a yellow, sooty flame.

SECTION – IV

3 × 8 = 24

15. (A) Defect: Myopia (near-sightedness) — he can see near objects clearly but not distant ones.

Causes: (i) excessive curvature of the eye lens; (ii) elongation of the eyeball.

The image of a distant object is formed in front of the retina.

Correction: a concave lens of suitable power is used; it diverges the rays so that the image forms on the retina.

Diagrams: (a) far point of myopic eye, (b) image in front of retina, (c) correction with concave lens.

Marks: name 1, causes 2, explanation 2, diagrams 3.

15. (B) Ohm's law: at constant temperature, the current through a conductor is directly proportional to the potential difference across its ends ($V \propto I$, $V = IR$).

Experiment: Connect a nichrome wire, ammeter, voltmeter (across the wire), key and one cell. Note V and I. Repeat with 2, 3, 4 cells.

Calculate V/I for each reading; it comes out nearly the same — this constant is the resistance R.

Graph: V–I graph is a straight line passing through the origin.

Marks: statement 2, circuit 2, procedure 2, graph 2.

16. (A) (i) Combustion: $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{heat and light}$

(ii) Oxidation: $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{alkaline KMnO}_4 + \text{heat} / \text{acidified K}_2\text{Cr}_2\text{O}_7} \text{CH}_3\text{COOH}$

(iii) Addition (hydrogenation, Ni catalyst): $\text{CH}_2=\text{CH}_2 + \text{H}_2 \rightarrow \text{CH}_3-\text{CH}_3$

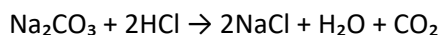
(iv) Substitution (in sunlight): $\text{CH}_4 + \text{Cl}_2 \rightarrow \text{CH}_3\text{Cl} + \text{HCl}$

Marks: 2 for each (explanation 1, equation 1).

16. (B) Activity: Take two test tubes A and B. Put 0.5 g sodium carbonate in A and 0.5 g sodium hydrogencarbonate in B. Add about 2 mL dilute HCl to each.

Pass the gas produced through lime water.

Observation: brisk effervescence; lime water turns milky — the gas is CO₂.



Test: $\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3$ (white ppt) + H₂O; with excess CO₂ the milky appearance disappears ($\text{Ca(HCO}_3)_2$).

Marks: procedure 3, observation 1, equations 4.

17. (A) Displacement: a more reactive element displaces a less reactive one. $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$

Double displacement: exchange of ions between reactants. $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 \downarrow + 2\text{NaCl}$

Redox: one substance is oxidised and the other reduced. $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ (CuO reduced, H₂ oxidised)

A double displacement reaction that forms an insoluble solid is called a precipitation reaction.

Marks: 2 each + 2 for precipitation.

17. (B) Let current I flow through a resistor R for time t under p.d. V .

Charge $Q = It$. Work done $W = VQ = VIt$.

This work is converted into heat: $H = VIt$.

By Ohm's law $V = IR \rightarrow H = (IR)It = I^2Rt$ (Joule's law of heating).

Applications (any three): electric iron, toaster, heater, electric bulb, electric fuse.

Marks: derivation 5, applications 3.

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