COMMON PRE-BOARD EXAMINATION
SCIENCE Code No. 086
MARKING SCHEME
CLASS-X-(2025-26)

SET: 2

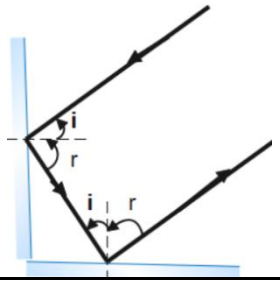
Time allowed: 3 Hrs. **Maximum Marks: 80**

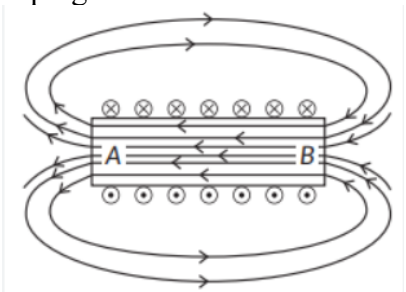
	SECTION A	
1.	B. ii & iii	1
2.	D. It's a growth -related movement.	1
3.	B. i and iii.	1
4.	B. KOH.	1
5.	C. Hind brain — Cerebellum.	1
6.	D. 100% tall with round seeds.	1
7.	C. Plants → Man.	1
8.	C. A is true but R is false	1
9.	D. A is false but R is true.	1
10.	No, it will not remain healthy. Two reasons (1 mark each): 1. Stomatal blockage: Vaseline blocks stomata, preventing gas exchange (CO_2 cannot enter) → photosynthesis declines. 1 Transpiration & cooling reduced: Reduced transpiration leads to impaired mineral uptake and overheating; water–nutrient balance disrupted → eventual wilting/death.	1
11.	A. Award 0.5 mark each for four correct labels = (**2 marks**) **OR** B. Sugars produced in the leaves accumulate above the girdle because phloem (downward translocation) is interrupted; leaves and upper parts may initially remain healthy or show swelling/sugar accumulation**.** Roots are starved of carbohydrates → root death → water and mineral uptake fail → entire tree eventually dies. Also bark/ phloem below girdle dies and stem cannot transport food downward**.**	2 1 1
12.	Top (apex) carnivores / highest trophic level. Reason: Harmful persistent chemicals (e.g., DDT, mercury) are not easily degraded and are stored in body tissues; with each transfer up the food chain these chemicals accumulate (biomagnification), so highest concentration occurs in apex predators.	1 1
13.	P: Adrenal glands (adrenals). Q: Kidneys (each adrenal lies on top of a kidney). R: Adrenaline (epinephrine). Physiological changes caused by adrenaline (1 mark total, award for listing two or three brief changes): Increased heart rate and breathing rate, dilation of pupils, increased blood glucose (glycogenolysis), redistribution of blood to muscles (vasodilation in muscles,	½ ½ ½

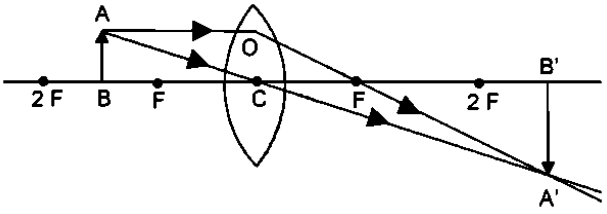
	vasoconstriction in skin), increased alertness.	1½
14.	i) Term for this cross: Monohybrid cross for a single trait showing dominance–recessive. ii) F_1 indicate- All F_1 showing red indicates red is dominant and parental cross was between oppositely homozygous parents (one homozygous dominant × homozygous recessive). iii) Genotypes: (a) Parents: Male (red) = RR (homozygous dominant); Female (white) = rr (homozygous recessive). (b) F_1 progeny: All Rr (heterozygous, phenotypically red). (c) F_2 progeny: Genotypic ratio approx 1 RR: 2 Rr: 1 rr; phenotypic ratio 3 red: 1 white (numerically 33:11 approximates 3:1)	1 1 1
15.	A. Nephrons (each kidney has ~1 million nephrons). **OR** B. Urea (major nitrogenous waste). C. *Two main functions of kidneys.* (1 mark each = 2 marks) • Excretion of nitrogenous wastes and toxins (urea, creatinine, drugs). • Osmoregulation / regulation of water–electrolyte balance and blood pressure (via reabsorption, secretion, ADH/aldosterone effects). D. (any two acceptable, award 0.5 each if two given): Level of ADH (antidiuretic hormone), state of hydration/osmotic gradient in medulla, aldosterone (affects Na^+ reabsorption and thus water), blood pressure/filtration rate.	1 1 1 1 1
16.	**A**: Diagram: i) female reproductive system 2→ Ovary produce ovum 3→ Uterus**,** implantation ii) Sexually transmitted disease • Two Viral STDs: AIDS (acquired immunodeficiency syndrome) – caused by HIV & Genital warts • Two Bacterial STDs: Syphilis & Gonorrhoea **OR** **B**: i) Chromosomes: Thread-like structures of DNA and proteins in nucleus carrying genes; visible during cell division. • Maintenance of chromosome number: In sexually reproducing organisms, meiosis reduces the diploid (2n) number to haploid (n) gametes; during fertilization two haploid gametes fuse restoring the diploid (2n) number in zygote. ii) Hydra (budding): New individual forms as an outgrowth (bud) on parent by mitotic cell division; bud detaches to form independent hydra. • Rhizopus (sporangiospore formation): Aerial hyphae produce sporangia containing many spores; spores are released and germinate into new mycelium (no budding). • Key differences (award within above): Hydra reproduction is by budding (multicellular outgrowth); Rhizopus reproduces by spore formation from hyphae (fungal sporulation). (implicit in answers above)	½ ½+½ ½+½ ½ ½+½ ½+½ 1 2 2

SECTION -B

17.	C. p = 3, q = 4	1
18.	C. The blue colour of the solution fades, and a reddish-brown solid is deposited on the strip.	1
19.	A. Blue litmus turns red	1
20.	C. Brisk effervescence occurs, and the gas turns lime water milky.	1
21.	D. Washing soda	1
22.	C. $CaSO_4.\ ½H_2O$	1
23.	B. CO	1
24.	A. Both A and R are true, and R is the correct explanation of A.	1
25.	A. Due to the free ions present in molten state B. Bubbles of hydrogen gas formed stick to the surface of calcium metal	1 1
26.	(i) On gentle heating: Turns white On strong heating: Turns brown The color changes indicate loss of water of crystallization (green → white) and thermal decomposition of $FeSO_4$ (white → brown) (ii) $2FeSO_4 \xrightarrow{\text{heat}} Fe_2O_3+SO_2+SO_3$	½ ½ ½ ½ 1
27.	A. (i) Copper and zinc. (ii) Stainless steel is harder, stronger, and more resistant to rust and corrosion than pure iron. (iii) Amalgam. **OR**	½+½ ½+½ 1
27.	B. (i) Mercury (Hg). (ii) Process – Roasting, $2HgS + 3O_2 \rightarrow 2HgO + 2SO_2$ (iii) By thermal decomposition, $2HgO \rightarrow 2Hg + O_2$	1 ½+½ ½ ½
28.	A. When its pH falls below 5.6. Acidity due - sulphur dioxide (SO_2) and nitrogen oxides (NO_x) react with water vapour to form strong acids such as sulphuric acid (H_2SO_4) and nitric acid (HNO_3). B. Acid rain lowers the pH of lakes, rivers, and streams, making the water more acidic. Many aquatic organisms cannot survive in low pH conditions. C. Marble is calcium carbonate ($CaCO_3$). Acids in acid rain react with calcium carbonate to form soluble compounds, water, and carbon dioxide. $CaCO_3$ (s)+H_2SO_4 (aq)→$CaSO_4$ (aq)+H_2O (l)+CO_2 (g) **OR** D. To neutralize basic soil, he should add a substance that is acidic in nature	½ ½ 1 1 1 2
29.	A. (i) Members differ by –CH_2–/Have similar chemical reactions due to the same functional group/Show gradual physical property changes (e.g., boiling point, melting point)/Can be represented by a general formula.	1

	(ii) a) ketone b) carboxylic acid (iii) Name: Butanal; Chemical formula: C_3H_7CHO (iv) $CH_3COOH + C_2H_5OH \rightarrow CH_3COOC_2H_5$; Esterification reaction, Ethyl ethanoate **OR** B.(i) C_6H_{12} (ii) C_5H_8; **C_7H_{12}** (iii) n-Butane & Isobutane (2-methylpropane/**For the correct Structures** (iv) A substitution reaction occurs $CH_4 + Cl_2$ sunlight $CH_3Cl + HCl$	½+½ ½+½ 1 ½+½ 1 ½+½ ½+½ 1 1
	SECTION C	
30.	D. $n_1 = n_3 < n_2$	1
31.	C. Color used to paint the danger signals	1
32.	D. A is false but R is true.	1
33.	**(i)** Power across the 100 Ω resistance = 81 W $P = I^2R = 81\ W$ $\therefore I^2 = \frac{81}{100}$ $\therefore I = \sqrt{\frac{81}{100}} = \frac{9}{10} = 0.9\ A$ (ii) Voltage across the 25 Ω resistors = $V_2 = IR_{eqv}$ for the 25 Ω resistors $\frac{1}{R_{eqv}} = \frac{1}{25} + \frac{1}{25} = \frac{2}{25}$ $\therefore R_{eqv} = \frac{25}{2} = 12.5\ \Omega$ $\therefore V_2 = 0.9\ A \times 12.5\ \Omega = 11.25\ V$	½ ½ ½ ½
34.	The incident ray and reflected ray will always be parallel to each other when the two plane mirrors are placed at a right angle (90°) to each other, regardless of the angle of incidence.  	1 1
35.	(i) viewed through hot air is atmospheric refraction/ "heat haze" or "heat shimmer". (ii) The air just above the fire becomes hotter. This hotter air is optically rarer but the colder air further up is optically denser so when we see the objects by the light coming from them through hot and cold air layers having different optical densities then refraction of light takes place randomly due to which the objects appear to be moving slightly.	1 1

	(iii)The wavy appearance of objects viewed through hot air above a campfire and the twinkling of stars are both caused by the phenomenon of atmospheric refraction. In both scenarios, light bends as it passes through air of different densities, and the continuous movement of these air pockets causes the light to shift and distort the image.	1
36.	A. (i) Joule's law of heating states that the heat (H) generated in a conductor is directly proportional to the square of the current (I^2), the resistance (R) of the conductor, and the time (t) for which the current flows. The relationship is mathematically expressed as ($H=I^2Rt$). (ii) Power, P= 2 kW, voltage, V=220V, Time, t = 7 x 3 = 21 h **E = P x t** = 2 x 21 = 42 per kWh Cost for 1 kWh = 4.25 Rs Total cost = 4.25 x 42 = 178.50 Rs **OR** B.(i) Initial length, l = 2 m Cross-section area, A = $0.5\ mm^2 = 0.5 \times 10^{-6} m^2$ Resistivity of copper, $\rho = 1.7 \times 10^{-8}\ \Omega\ m$ Step 1: Calculate the initial resistance R_1 and = 2 m $R_1 = \frac{\rho.l}{A} = \frac{1.7\times10^{-8}\ \Omega.m\times2\ m}{0.5\times10^{-6}m^2}$ $R_1 = \frac{3.4\times10^{-8}}{0.5\times10^{-6}}\Omega = 0.068\ \Omega$ Step 2: Calculate the new resistance R_2 and = 4 m (double length) $R_2 = \frac{\rho.(2l)}{A} = 2 \times R_1 = 2 \times 0.068\ \Omega = 0.136\ \Omega$ The resistance of the wire when the length is double is $0.136\ \Omega$ (ii) a) Both are dependent on the material's composition. b) The value of both typically increases with an increase in temperature. Both resist the flow of the current.	1 1 1 1 1 1(Any one)
37.	End A will be the north pole because, when viewing from the A end, the current appears to flow in an anti-clockwise direction. Inside the solenoid, the magnetic field lines will be parallel to the axis, pointing from B to A, and will emerge from A, looping back to enter at B. 	1 1 1

38.	A. Convex Lens B. Negative as the image is real and inverted. ***Attempt either subpart C or D.*** C. $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{20} = \frac{1}{v} - \frac{1}{-20}$ $\frac{1}{v} = \frac{1}{20} - \frac{1}{21}$ $= \frac{21-20}{420}$ $= \frac{1}{420}$ $v = 420$ cm D. 	1 1 ½ 1 ½ 2
39.	**A.** **(a)** Total resistance of circuit = 20 Ω + 4 Ω = 24 **(b)** Resistance of conductor= 4 Ω Voltage battery = 6 V Apply Ohms law 6 V =I × 24 Ω $I = \frac{6V}{24\Omega} = 0.25A$ Hence, current in the circuit is 0.25A (i) Potential difference across the lamp $V_{lamp} = IR$ $V_{lamp} = 0.25\ A \times 20\ \Omega = 5\ V$ $\therefore V_{lamp} = 5\ V$ (ii) Potential difference across the conductor $V_{conductor} = IR$ $V_{conductor} = 0.25A \times 4\Omega = 1V$ $V_{conductor} = 1V$ **(d)** Power of lamp $I^2R = (0.25)^2 \times 20 = 1.25W$	1 1 1 1 1

39. B(a)	Case 1:	Let I be the current through the bulb and R be the resistance. We know that, **P = V * I** **I** = P / V = 40 / 220 **= 0.18 A** We know that resistance is given as **R =** V 2 / P = (220) 2 / 40 = **1210 ohm.**	1 ½
	Case 2:	Let I be the current through the bulb and R be the resistance. We know that, **P = V * I** **I** = P / V = 25 / 220 **= 0.113 A** We know that resistance is given as **R =** V 2 / P = (220) 2 / 25 = **1936 ohm.**	1 ½
		Thus, there is a change in the value of current and resistance in the two cases. The **current in case 1 is more** since its **resistance is lesser** than the resistance of case 2.	
39.B (b)		Let the resistance of the wire be R, heat produced in the fuse at 5 A in 1 s is $H = (5)^2R \quad (\because H = I^2Rt)$	½
		So, fuse melts at $(5)^2R$ joules of heat. Let, the resistance of new wire is R' So, heat produced in 1 second $= (10)^2R'$ To prevent it from melting $(5)^2R = (10)^2R'$ or $R' = \frac{R}{4}$, As $R \propto \frac{1}{A}$ $\therefore$ cross-sectional area of new fuse wire is four times the first fuse. Now, $A = \pi r^2$, so new radius is twice the previous one. So, at 10A, the new fuse wire of same material and length has larger radius than the earlier one.	½ 1