



COMMON PRE-BOARD EXAMINATION
SCIENCE Code No. 086



MARKING SCHEME

CLASS-X-(2025-26)

SET: 1

Time allowed: 3 Hrs.

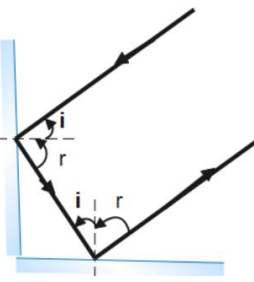
Maximum Marks: 80

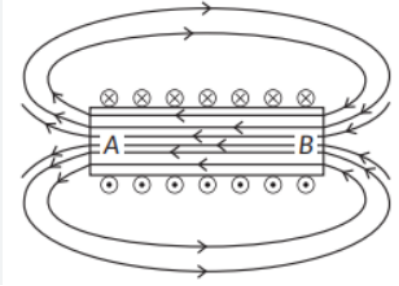
SECTION A		
1.	D. 100% tall with round seeds.	1
2.	C. Plants → Man.	1
3.	B. i and iii.	1
4.	B. KOH.	1
5.	C. Hind brain — Cerebellum.	1
6.	D. It's a growth-related movement	1
7.	A. Spinal cord.	1
8.	C. A is True but R is false.	1
9.	D. A is false but R is true.	1
10.	Top (apex) carnivores / highest trophic 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
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.	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. 2. Transpiration & cooling reduced: Reduced transpiration leads to impaired mineral uptake and overheating; water–nutrient balance disrupted → eventual wilting/death.	1 1
13.	i) 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	1 1 1

	<p>recessive).</p> <p>(b) F₁ progeny: All Rr (heterozygous, phenotypically red).</p> <p>(c) F₂ progeny: Genotypic ratio approx 1 RR: 2 Rr: 1 rr; phenotypic ratio 3 red: 1 white (numerically 33:11 approximates 3:1).</p>	
14.	<p>P: Adrenal glands (adrenals).</p> <p>Q: Kidneys (each adrenal lies on top of a kidney).</p> <p>R: Adrenaline (epinephrine).</p> <p>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, vasoconstriction in skin), increased alertness.</p>	<p>½</p> <p>½</p> <p>½</p> <p>1½</p>
15.	<p>A. Nephrons (each kidney has ~1 million nephrons). (1 mark)</p> <p style="text-align: center;">OR</p> <p>B. Urea (major nitrogenous waste).</p> <p>C. <i>Two main functions of kidneys.</i> (1 mark each = 2 marks)</p> <ul style="list-style-type: none"> • Excretion of nitrogenous wastes and toxins (urea, creatinine, drugs). • Osmoregulation / regulation of water–electrolyte balance and blood pressure (via reabsorption, secretion, ADH/aldosterone effects). <p>D. Answer (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.</p>	<p>4</p> <p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>+½</p>
16.	<p>A: Diagram: i) female reproductive system</p> <p>2→ Ovary produce ovum</p> <p>3→ Uterus and implantation</p> <p>ii) Sexually transmitted disease</p> <ul style="list-style-type: none"> • Two Viral STDs: AIDS (acquired immunodeficiency syndrome) – caused by HIV & Genital warts • Two Bacterial STDs: Syphilis & Gonorrhoea <p style="text-align: center;">OR</p> <p>B: i) Chromosomes: Thread-like structures of DNA and proteins in nucleus carrying genes; visible during cell division.</p> <ul style="list-style-type: none"> • 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. <p>ii)</p> <ul style="list-style-type: none"> • 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) 	<p>½</p> <p>½+½</p> <p>½+½</p> <p>½</p> <p>½+½</p> <p>½+½</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p>

SECTION -B

17.	B. CO	1
18.	C. CaSO ₄ . ½H ₂ O	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. K ₂ O (Potassium oxide)	1
23.	C. p = 3, q = 4	1
24.	A. Both A and R are true, and R is the correct explanation of A.	1
25.	i) Because the strong electrostatic forces between oppositely charged ions require a large amount of energy to break.	1 1
	ii) Na & K are highly reactive and catches fire with air.	
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)	½ ½ ½ ½
	(ii) $2\text{FeSO}_4 \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$	1
27. A	A. (i) Copper and zinc. (ii) Stainless steel is harder, stronger, and more resistant to rust and corrosion than pure iron. (iii) Amalgam.	½+½ ½+½ 1
	OR	
27.B	B. (i) Mercury (Hg). (ii) Process – Roasting, $2\text{HgS} + 3\text{O}_2 \rightarrow 2\text{HgO} + 2\text{SO}_2$ (iii) By thermal decomposition, $2\text{HgO} \rightarrow 2\text{Hg} + \text{O}_2$	1 ½+½ ½+½
28.	A. When its pH falls below 5.6. Acidity due to sulphur dioxide (SO ₂) and nitrogen oxides (NO _x) react with water vapour to form strong acids such as sulphuric acid (H ₂ SO 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. $\text{CaCO}_3 (\text{s}) + \text{H}_2\text{SO}_4 (\text{aq}) \rightarrow \text{CaSO}_4 (\text{aq}) + \text{H}_2\text{O} (\text{l}) + \text{CO}_2 (\text{g})$	½ ½ 1 1 1
	OR	
	D. To neutralize basic soil, he should add a substance that is acidic in nature	2

29.	<p>A. (i) Members differ by $-\text{CH}_2-$/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.</p> <p>(ii) a) ketone b) carboxylic acid</p> <p>(iii) Name: Butanal; Chemical formula: $\text{C}_3\text{H}_7\text{CHO}$</p> <p>(iv) $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \rightarrow \text{CH}_3\text{COOC}_2\text{H}_5$; Esterification reaction, Ethyl ethanoate</p> <p style="text-align: center;">OR</p> <p>B. (i) C_6H_{12}</p> <p>(ii) C_5H_8; C_7H_{12}</p> <p>(iii) n-Butane & Isobutane (2-methylpropane/For the correct Structures)</p> <p>(iv) A substitution reaction occurs $\text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{sunlight}} \text{CH}_3\text{Cl} + \text{HCl}$</p>	<p>1</p> <p>$\frac{1}{2} + \frac{1}{2}$</p> <p>$\frac{1}{2} + \frac{1}{2}$</p> <p>1</p> <p>$\frac{1}{2} + \frac{1}{2}$</p> <p>1</p> <p>$\frac{1}{2} + \frac{1}{2}$</p> <p>$\frac{1}{2} + \frac{1}{2}$</p> <p>1</p> <p>1</p>
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.	<p>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.</p>  <p style="text-align: center;">[Diagram-1]</p>	<p>1</p> <p>1</p>
34.	<p>(i) Power across the 100Ω resistance = 81 W</p> <p>$P = I^2 R = 81 \text{ W}$</p> <p>$\therefore I^2 = \frac{81}{100}$</p> <p>$\therefore I = \sqrt{\frac{81}{100}} = \frac{9}{10} = 0.9 \text{ A}$</p> <p>(ii) Voltage across the 25Ω resistors = $V_2 = I R_{\text{eqv}}$ for the 25Ω resistors</p> $\frac{1}{R_{\text{eqv}}} = \frac{1}{25} + \frac{1}{25} = \frac{2}{25}$ <p>$\therefore R_{\text{eqv}} = \frac{25}{2} = 12.5 \Omega$</p> <p>$\therefore V_2 = 0.9 \text{ A} \times 12.5 \Omega = 11.25 \text{ V}$</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>
35.	<p>(i) viewed through hot air is atmospheric refraction/ "heat haze" or "heat shimmer".</p> <p>(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.</p>	<p>1</p> <p>1</p>

	(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.	<p>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 ($H=I^2Rt$).</p> <p>(ii) Power, $P=2\text{ kW}$, voltage, $V=220\text{V}$, Time, $t=7 \times 3 = 21\text{ h}$ $E = P \times t$ $= 2 \times 21 = 42\text{ per kWh}$ Cost for 1 kWh = 4.25 Rs Total cost = $4.25 \times 42 = 178.50\text{ Rs}$</p> <p style="text-align: center;">OR</p> <p>B. (i) Initial length, $l = 2\text{ m}$ Cross-section area, $A = 0.5\text{ mm}^2 = 0.5 \times 10^{-6}\text{ m}^2$ Resistivity of copper, $\rho = 1.7 \times 10^{-8}\ \Omega\text{ m}$ Step 1: Calculate the initial resistance R_1 and $l = 2\text{ m}$ $R_1 = \frac{\rho \cdot l}{A} = \frac{1.7 \times 10^{-8}\ \Omega \cdot \text{m} \times 2\text{ m}}{0.5 \times 10^{-6}\text{ m}^2}$ $R_1 = \frac{3.4 \times 10^{-8}\ \Omega}{0.5 \times 10^{-6}} = 0.068\ \Omega$ Step 2: Calculate the new resistance R_2 and $l = 4\text{ m}$ (double length) $R_2 = \frac{\rho \cdot (2l)}{A} = 2 \times R_1 = 2 \times 0.068\ \Omega = 0.136\ \Omega$ The resistance of the wire when the length is double is $0.136\ \Omega$</p> <p>(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.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1(Any one)</p>	
37.	<p>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. Diagram-1</p>		<p>1</p> <p>1</p> <p>1</p>

38.	<p>A. The lens used in a DSLR camera is a convex lens, also known as a converging lens, which has a positive focal length.</p> <p>B. The image formed on the sensor is a real, inverted, and diminished image.</p> <p>C.</p> $\frac{1}{u} = \frac{1}{v} - \frac{1}{f}$ <p>Substitute the values:</p> $\frac{1}{u} = \frac{1}{60} - \frac{1}{50}$ <p>Calculate each term:</p> $\frac{1}{u} = \frac{50-60}{3000} - \frac{-10}{3000} = -\frac{1}{300}$ <p>Thus, the negative sign indicates that the object is located 300 mm in front of the lens (on the opposite side from the image). So, the object distance is:</p> <p>$u = 300 \text{ mm}$</p> <p style="text-align: center;">OR</p> <p>D.</p> $m = \frac{\text{image height}}{\text{object height}}$ <p>Substituting the values:</p> $m = \frac{-20 \text{ mm}}{80 \text{ mm}} = -\frac{1}{4}$ <p>Thus, the magnification $m = -0.25 \text{ mm}$.</p> <p>Magnification is also given by:</p> $m = \frac{v}{u}$ <p>where:</p> <ul style="list-style-type: none"> • v is the image distance • $u = -150 \text{ mm}$ <p>Rearrange to solve for v:</p> $v = m \times u = -0.25 \times -150 \text{ mm} = 37.5 \text{ mm}$ <p>So, the image distance $v = 37.5 \text{ mm}$.</p> <p>The lens formula is:</p> $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ <p>Substituting the values of v and u:</p> $\frac{1}{f} = \frac{1}{37.5} + \frac{1}{150}$ <p>Converting to a common denominator:</p> $\frac{1}{f} = \frac{4+1}{150} = \frac{5}{150} = \frac{1}{30}$ <p>Thus, $f = 30 \text{ mm}$</p> <p>The focal length of the camera lens is 30 mm.</p>	<p>1</p> <p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>
39.	<p>A. (i)</p> <ul style="list-style-type: none"> • Over all resistance increases and current from the power supply is low. • If one electrical appliance stops working due to some defect then all other appliances also stop working. 	<p>1</p> <p>1</p>

(ii) $R_1 = 6 \Omega$, $R_2 = 4 \Omega$, $R_3 = 15 \Omega$, $R_4 = 3 \Omega$, $R_5 = 3 \Omega$

R_1 and R_2 are in series.

$$R_s = R_1 + R_2$$

$$= 6 + 4$$

$$\mathbf{R_s = 10 \Omega}$$

R_4 and R_5 are in series.

$$R_s' = R_4 + R_5$$

$$= 3 + 3$$

$$\mathbf{R_s' = 6 \Omega}$$

R_s , R_s' and R_3 are in parallel.

$$1/R_{eq} = 1/R_s + 1/R_s' + 1/R_3$$

$$= 1/10 + 1/15 + 1/6$$

$$\mathbf{R_{eq} = 3 \Omega}$$

1/2

1/2

1/2

1/2

1/2

1/2

(OR)

B. (a) Case 1:

Let I be the current through the bulb and R be the resistance.

We know that,

$$\mathbf{P = V * I}$$

$$I = P / V$$

$$= 40 / 220$$

$$\mathbf{= 0.18 A}$$

We know that resistance is given as

$$\mathbf{R = V^2 / P}$$

$$= (220)^2 / 40$$

$$\mathbf{= 1210 \text{ ohm.}}$$

1 1/2

Case 2:

$$\mathbf{P = V * I}$$

$$I = P / V$$

$$= 25 / 220$$

$$\mathbf{= 0.113 A}$$

We know that resistance is given as

$$\mathbf{R = V^2 / P}$$

$$= (220)^2 / 25$$

$$\mathbf{= 1936 \text{ ohm.}}$$

Therefore,

- The current drawn by the bulb = **0.113 A**
- The resistance of the bulb = **1936 ohm**

1 1/2

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.

	<p>(b) Let the resistance of the wire be R, heat produced in the fuse at 5 A in 1 s is</p> $H = (5)^2 R \quad (\because H = I^2 R t)$ <p>So, fuse melts at $(5)^2 R$ joules of heat.</p> <p>Let, the resistance of new wire is R'</p> <p>So, heat produced in 1 second = $(10)^2 R'$</p> <p>To prevent it from melting</p> $(5)^2 R = (10)^2 R' \text{ or } R' = \frac{R}{4}, \text{ As } R \propto \frac{1}{A}$ <p>\therefore cross-sectional area of new fuse wire is four times the first fuse.</p> <p>Now, $A = \pi r^2$, so new radius is twice the previous one.</p> <p>So, at 10A, the new fuse wire of same material and length has larger radius than the earlier one.</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p>
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