



COMMON PRE-BOARD EXAMINATION

SCIENCE –Code No. 086

MARKING SCHEME

CLASS-X-(2025-26)

SET: 2

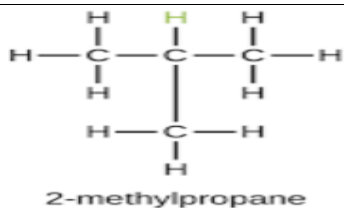


Q. No.	SECTION A	Marks
1	B. Decrease in oxygen level	1
2	A. Adrenaline	1
3	B. Conditioned reflex	1
4	C. Respiration	1
5	B. Both parents carry recessive 'i' allele	1
6	A. Amoeba	1
7	C. (iii), (iv), (v)	1
8	C. A is true but R is false.	1
9	A. Both A and R are true, and R is the correct explanation of A.	1
10	Useful substances are reabsorbed from the filtrate back into the blood through selective reabsorption in the tubules.	2
11	<p><u>Students to attempt either option A or B.</u></p> <p>A. (a)</p> <p>A – Pulmonary Artery ½</p> <p>B – Pulmonary Vein ½</p> <p>(b) Pulmonary artery carries deoxygenated blood from the heart to the lungs. ½</p> <p>Pulmonary vein carries oxygenated blood from the lungs to the heart. ½</p> <p style="text-align: center;">OR</p> <p>B. •Xylem is essential because it transports water and minerals from roots to leaves, which are needed for photosynthesis and other processes.</p> <p>• Phloem complements this by carrying the food made in leaves to all parts of the plant for growth and storage. 2</p>	2
12	Algae → Producer / 1st trophic level ½	2
	Small fish → Primary consumer / 2nd level ½	

	Big fish → Secondary consumer / 3rd level Kingfisher → Tertiary consumer / 4th level	½ ½	
13	Gametes = RY, Ry, rY, ry (ii) Phenotypic ratio = 9 : 3 : 3 : 1 → 9 round yellow, 3 round green, 3 wrinkled yellow, 1 wrinkled green (iii) Law of Independent Assortment.	2 1	3
14	<ul style="list-style-type: none"> • Voluntary actions (like writing or walking) are controlled by the cerebrum, which sends messages to muscles through motor nerves. • Involuntary actions (like heartbeat, breathing, digestion) are controlled by the medulla oblongata and midbrain. <p>The cerebellum helps in maintaining balance and posture during voluntary actions. Thus, different parts of the brain coordinate to ensure smooth and controlled functioning of the body.</p>	1 1	3
15	<p><u>Attempt either subpart A or B.</u></p> <p>A. During running, Rahul's muscles need more oxygen. The respiratory system brings in more oxygen and removes carbon dioxide. The circulatory system carries oxygen and glucose to the muscles and takes carbon dioxide back to the lungs. Both systems work together to supply energy to the muscles.</p> <p style="text-align: center;">OR</p> <p>B. When Rahul's muscles did not get enough oxygen during running, anaerobic respiration occurred in his muscle cells.</p> <p>In this process, glucose is partially broken down to form lactic acid and energy.</p> <p>Chemical equation:</p> <p style="text-align: center;">Glucose ($C_6H_{12}O_6$) → Lactic acid ($2C_3H_6O_3$) + Energy</p> <p>C. Glucose ($C_6H_{12}O_6$) is broken down</p> <p>D. Aerobic respiration produces more ATP because glucose is completely broken down in the presence of oxygen into carbon dioxide and water, releasing much more energy. Anaerobic respiration only partially breaks down glucose, so it releases much less ATP.</p> <p><u>For visually impaired students</u></p> <p>D. Rahul's muscles needed more oxygen to produce extra energy, so breathing rate increased to supply more oxygen to body cells.</p>	2 1 1	4
16	<p><u>Attempt either option A or B.</u></p> <p>A. (i) Suitable Method:</p> <ul style="list-style-type: none"> • Potato plants are best grown by vegetative propagation using tubers. 	1	5

	<ul style="list-style-type: none"> This method is preferred because it is faster, the new plants grow true to the parent, and potatoes usually do not produce seeds or the seeds may not give desirable plants. 1 ½ <p>(ii) Small differences arise due to mutations during DNA replication or environmental factors. 1</p> <p>These variations can be beneficial, harmful, or neutral, depending on whether they improve survival, affect growth negatively, or have no effect. 1 ½</p> <p style="text-align: center;">OR</p> <p>B. (i) Fertilization:</p> <ul style="list-style-type: none"> Fertilization occurs when a sperm cell from the male fuses with the egg (ovum) from the female. 1 It usually takes place in the fallopian tube. ½ The fusion forms a zygote, which carries genetic material from both parents. 1 <p>(ii) Post-Fertilization and Implantation:</p> <ul style="list-style-type: none"> The zygote undergoes repeated cell division to form an embryo. ½ The embryo travels to the uterus and undergoes implantation by attaching to the uterine wall. 1 This ensures the embryo receives nutrients and support for further development. 1 	
SECTION B		
17	D. $p = 2, q = 2$	1
18	A. The green solution in the first test tube turns colourless, and the second test tube remains colourless with no change.	1
19	C. The pH will increase.	1
20	A.No change Turns blue	1
21	B. (i) and (ii)	1
22	B. $2\text{NaOH} + \text{Zn} \longrightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$	1
23	B. The pH will increase.	1
24	D. A is false but R is true.	1
25	<p>(a) Noble metals like gold and platinum are exceptionally suitable for making jewellery because they are highly unreactive and resistant to corrosion and tarnishing.</p> <p>(b) sodium can be easily cut with a knife indicates that it is a soft metal, and its storage in kerosene indicates that it is a highly reactive metal and catches fire easily. 1 + 1</p>	2

26	<p>a) The green colour of the crystal's changes to white. This indicates the loss of the seven molecules of water of crystallisation.</p> <p>(b) The two gases evolved are Sulphur dioxide (SO₂) and Sulphur trioxide (SO₂). Sulphur dioxide (SO₂) has a characteristic pungent smell of burning sulphur.</p> <p>(c) The solid compound left behind is reddish-brown in colour. Its chemical name is Ferric oxide (or Iron(III) oxide) – Fe₂O₃ 1+1+1</p>	3
27	<p>A.</p> <p>(i) An example of a basic metal oxide is Sodium oxide (Na₂O) or Magnesium oxide (MgO).</p> <p>(ii) An example of an amphoteric oxide is Aluminium oxide (Al₂O₃) or Zinc oxide (ZnO).</p> <p>(iii) Equation: ZnO (s) + 2HCl(aq) → ZnCl₂(aq) + H₂O (l) 1+1+1</p> <p style="text-align: center;">OR</p> <p>B. (i) Sodium (Na) or Potassium (K) reacts violently with cold water. The hydrogen gas evolved immediately catches fire.</p> <p>(ii) A metal that reacts only with steam is Iron (Fe) or Aluminium (Al).</p> <p>(iii) Equation: 3Fe(s) + 4H₂O(g) → Fe₃O₄(s) + 4H₂(g) 1+1+1</p>	3
28	<p>(a) The substance responsible for tooth decay is acid. 1</p> <p>(b) Tooth enamel (calcium phosphate) is basic in nature. When the pH in the mouth drops below 5.5 (becomes acidic), the enamel reacts with the acid and gets neutralized. This process of reaction and dissolution is known as corrosion or decay. 1</p> <p style="text-align: center;">OR</p> <p>Toothpastes are generally basic (alkaline) in nature. When used for brushing, the toothpaste neutralizes the excess acid produced by bacteria in the mouth. This prevents the pH from falling below the critical value of 5.5 and thereby prevents tooth decay</p> <p>(c) A neutralization reaction is a reaction between acid and base to form salt and water Example: Using antacid tablets which contains a base to relieve acidity or indigestion caused by excess acid in the stomach 2</p>	4
29	<p>A.</p> <p>(a) Name: Butane ½ + ½</p> <p>Structure:</p> $ \begin{array}{cccc} \text{H} & \text{H} & \text{H} & \text{H} \\ & & & \\ \text{H}-\text{C} & -\text{C} & -\text{C} & -\text{C}-\text{H} \\ & & & \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array} $ <p>(b) Name: 2-methylpropane (or isobutane) ½ + ½</p>	5



c) The relationship is called Isomerism.

Definition: Isomerism is the phenomenon wherein two or more compounds have the same molecular formula but different structural arrangements of atoms, leading to different physical and chemical properties. 1/2 + 1/2

(d) The straight-chain isomer (butane) has a larger surface area than the branched-chain isomer (2-methylpropane). This leads to stronger intermolecular van der Waals forces of attraction between butane molecules, which require more energy (a higher temperature) to overcome. Thus, butane has a higher boiling point. 1

(e) Balanced equation: $2C_4H_{10}(g) + 13O_2(g) \rightarrow 8CO_2(g) + 10H_2O(l) + \text{Heat}$ 1

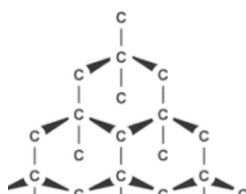
OR

B.

(a) The valency of carbon is 4. The property that allows carbon to form long chains with itself is called catenation. 1/2 + 1/2

(b) The different forms of carbon with different physical properties but identical chemical properties are called allotropes. A hard crystalline form is diamond, and a soft crystalline form is graphite. 1/2 + 1/2

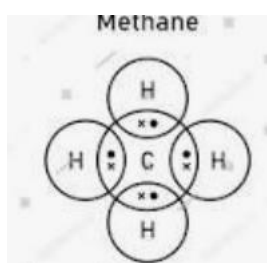
(c) The hard crystalline form is diamond. 1

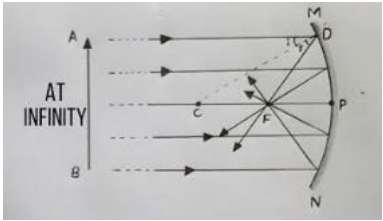


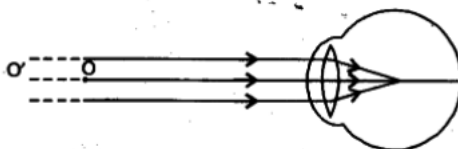
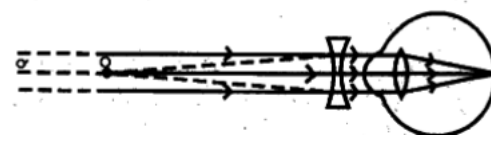
(d) The type of bonds present in compounds of carbon are covalent bonds. These compounds are generally poor conductors of electricity because they do not have free electrons or mobile ions to carry an electric current. 1/2 + 1/2

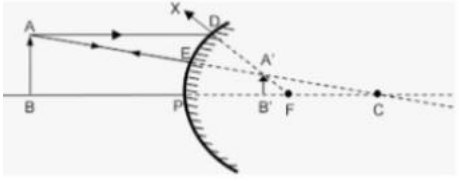
(e) The simplest compound formed between methane.

1



Q. No.	SECTION C	Marks
30	B. The different colors of light are refracted at different angles due to their different speeds inside the prism.	1
31	C. I, II and III.	1
32	C. A is true but R is false.	1
33	<p>(a) The principal focus (F) of a concave mirror is the point on the principal axis where rays of light parallel to the principal axis converge after reflecting from the mirror.</p> <p>(b) $f = \frac{R}{2}$</p> <p>(c) </p>	<p>2</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p>
34	<p>Top branch – Resistance is connected in series $R = 4\Omega + 2\Omega = 6\Omega$</p> <p>Bottom branch – Resistance is connected in parallel $R = 3\Omega + 3\Omega = 6\Omega$</p> <p>Those 6Ω branches are in parallel</p> <p>$\frac{1}{R_{eq}} = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3} \Rightarrow R_{eq} = 3\Omega$</p> <p>Total current (ammeter reading), $I = \frac{V}{R_{eq}} = \frac{6}{3} = 2\text{ A}$.</p> <p>(Each branch carries $I_{branch} = \frac{6}{6} = 1\text{ A}$, so currents split equally.)</p> <p style="text-align: center;">OR</p> <p>Equivalent resistance of the two 8Ω resistors (parallel)</p> <p style="text-align: center;">$\frac{1}{R_p} = \frac{1}{8} + \frac{1}{8} = \frac{2}{8} = \frac{1}{4}$ $R_p = 4\Omega$</p> <p>The 4Ω resistor (series) and the 4Ω parallel combination add:</p> <p style="text-align: center;">$R_{total} = 4 + 4 = 8\Omega$</p> <p>Total current from the battery (and through the 4Ω resistor)</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p>

	$I = \frac{V}{R_{\text{total}}} = \frac{2}{8} = 0.25 \text{ A}$ <p>Potential difference across the 8Ω–8Ω combination That parallel pair together has $R_p = 4 \Omega$. Hence voltage across it:</p> $V_p = I \times R_p = 0.25 \times 4 = 1 \text{ V}$	
35	<p>(i) To obtain maximum resistance, connect the resistors in series and to obtain maximum current, connect the resistors in parallel. 1</p> <p>(ii) Series Connection (Maximum Resistance):</p> $R_s = R_1 + R_2 = 3 + 6 = 9 \Omega$ <p>Current,</p> $I_s = \frac{V}{R_s} = \frac{6}{9} = 0.67 \text{ A}$ <p>Parallel Connection (Maximum Current):</p> $\frac{1}{R_p} = \frac{1}{3} + \frac{1}{6} = \frac{2 + 1}{6} = \frac{1}{2}$ $R_p = 2 \Omega$ <p>Current,</p> $I_p = \frac{V}{R_p} = \frac{6}{2} = 3 \text{ A}$	3
36	<p>(i) Myopia or shortsightedness. 1</p> <p>(ii) </p> <p>(iii) </p>	3
37	<p>(i) The direction of the magnetic field also reverses when the direction of current in the conductor is reversed. 1</p> <p>(ii) The Right-Hand Thumb Rule is used. According to it, if we hold the conductor in the right hand with the thumb pointing in</p>	3

	<p>the direction of current, then the wrapped fingers give the direction of the magnetic field lines. 1</p> <p>(iii) The magnetic field lines form concentric circles around the conductor. 1</p>	
38	<p>A. Virtual, erect and diminished image. 1</p> <p>B. A convex mirror gives a wider field of view than a plane or concave mirror. That is why it is used as a rear-view mirror. 1</p> <p>C.</p>  <p style="text-align: center;">OR</p> <p>D. $u = -15$, $f = 10\text{cm}$</p> $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ $v = \frac{-15 \times (10)}{-15 - (10)} = \frac{-150}{-25} = 6 \text{ cm}$	4
39	<p>A.</p> <p>(i) When an electric current passes through a conductor, the heat produced (H) is directly proportional to $H \propto I^2 R t$</p> <p>or $H = I^2 R t$ 1</p> <p>It should have high resistivity (to produce more heat). It should have a high melting point and not oxidize easily at high temperatures. 1</p> <p>Case 1 – Maximum heating (Power = 880 W): 1 ½</p> $P = VI \Rightarrow I = \frac{P}{V} = \frac{880}{220} = 4 \text{ A}$ $R = \frac{V}{I} = \frac{220}{4} = 55 \Omega$ <p>Case 2 – Minimum heating (Power = 440 W): 1 ½</p> $I = \frac{P}{V} = \frac{440}{220} = 2 \text{ A}$ $R = \frac{V}{I} = \frac{220}{2} = 110 \Omega$ <p style="text-align: center;">OR</p>	5

B.

(i) Electric power is the rate at which electrical energy is consumed or converted into other forms of energy in an electric circuit. S.I. unit is watt

$$P = \frac{W}{t}$$

From Ohm's law, $V = IR$

$$P = VI$$

Substituting $I = \frac{V}{R}$,

$$P = V \times \frac{V}{R} = \frac{V^2}{R} \quad 2$$

(ii) Given: $V = 220 \text{ V}$, $P = 100 \text{ W}$

$$I = \frac{P}{V} = \frac{100}{220} = 0.4545 \text{ A} \quad 1$$

$$(iii) R = \frac{V}{I} = \frac{220}{0.4545} \approx 484 \Omega \quad 1$$

(iv) Energy consumed in 5 hours: $E = P \times t = 100 \times 5 = 500 \text{ Wh} = 0.5 \text{ kWh} \quad 1$