COMMON PRE-BOARD EXAMINATION

SCIENCE – Code No. 086

CLASS-X-(2025-26)

SET: 2

MARKING SCHEME

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

Section A

Q. No.	Value Points	Split-up Marks	Marks Allotted
1.	B. The population of deer would increase drastically.	1	1
2.	C. They possessed several pairs of easily identifiable, contrasting haracteristics.	1	1
3.	C. (i) and (iv)	1	1
4.	D. Medulla	1	1
5.	C. To emulsify large fat globules into smaller droplets.	1	1
6.	B. To carry digested fats and return fluid from tissues to the blood	1	1
7.	B. That only 10% of the energy from one trophic level is incorporated into the next level.	1	1
8.	A. Both A and R are true, and R is the correct explanation of A	1	1
9.	C. A is true but R is false	1	1
10.	Highest DDT in humans; Biomagnification When pesticides like DDT enter the food chain, they cannot be broken down by the body and accumulate in the tissues of each organism. As we move up the food chain, the concentration of the pesticide increases at each trophic level, because each organism eats many individuals from the level below. Therefore, humans, being at the top of the food chain, have the highest concentration of DDT in their bodies.	½ ½ ½ ½	2
11.	The amount of oxygen dissolved in water is much lower than the amount of oxygen present in air. To obtain enough oxygen, fish must take in a larger volume of water through their gills continuously. Therefore, they have a faster rate of breathing compared to terrestrial animals, which get oxygen more easily from air. OR During summer, the body loses more water through sweating to keep cool. To conserve water, the kidneys reabsorb more water back into the bloodstream. As a result, less urine is produced, and it becomes more concentrated (thicker) in appearance.	1 1 1 ½ ½	2
12.	Photosynthesis Absorption of light energy by chlorophyll	½ ½	2

<table>
<tr><td></td><td>Conversion of light energy into chemical energy and splitting of water into Hydrogen and Oxygen.
Reduction of carbon dioxide into carbohydrates</td><td>½
½</td><td></td></tr>
<tr><td>13.</td><td>Cross:
Parents Violet (VV) × White (vv)
Gametes V v
F_1 Generation Vv (Violet)

Self-pollination of F_1 plants:
Vv × Vv
<table><tr><td>Gametes</td><td>V</td><td>V</td></tr><tr><td>V</td><td>VV</td><td>Vv</td></tr><tr><td>v</td><td>Vv</td><td>Vv</td></tr></table>Genotypes: 1 VV : 2 Vv : 1 vv
Phenotypes: 3 Violet : 1 White
Ratio = 3 : 1
(i) Phenotype of F_1 - All violet flowers
(ii) F_2 ratio (violet: white) - 3:1
(iii) Type of cross - Monohybrid cross</td><td>Cross 1 ½

½
½
½</td><td></td></tr>
<tr><td>14.</td><td>Phototropism is the growth movement of a plant in response to light.

Auxin causes phototropism

When light falls on one side of the plant shoot, the other side remains in the shade.

Auxin moves from the illuminated side to the shaded side of the shoot tip.

The shaded side now has a higher concentration of auxin, which causes the cells there to elongate more than those on the lighted side.

Because the shaded side grows faster, the shoot bends toward the light source, helping the plant absorb more sunlight for photosynthesis.</td><td>½

½

½

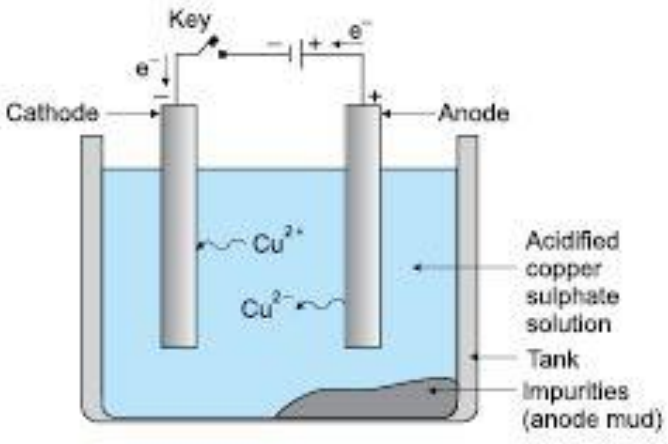
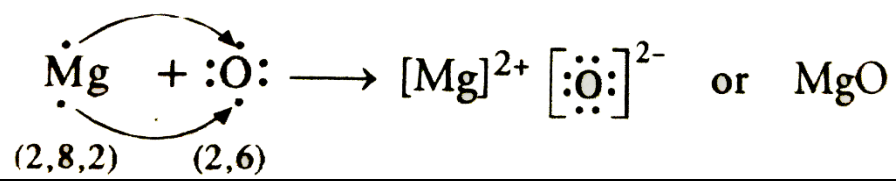
½

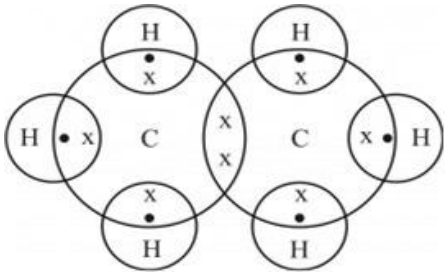
½

½</td><td>3</td></tr>
<tr><td>15.</td><td>A. P: Diastolic (80 mmHg)
Q: Systolic (120 mmHg)
B. Pulmonary artery
<table><tr><th>Feature</th><th>Arteries</th><th>Veins</th></tr><tr><td>Direction of blood flow</td><td>Carry blood away from the heart</td><td>Carry blood towards the heart</td></tr><tr><td>Type of blood carried</td><td>Usually carry oxygenated blood (except pulmonary artery)</td><td>Usually carry deoxygenated blood (except pulmonary vein)</td></tr><tr><td>Wall thickness</td><td>Have thick, elastic walls to withstand high pressure</td><td>Have thin walls and less elastic tissue</td></tr><tr><td>Valves</td><td>No valves (except at heart exit)</td><td>Valves present to prevent backflow of blood</td></tr></table></td><td>½
½
1

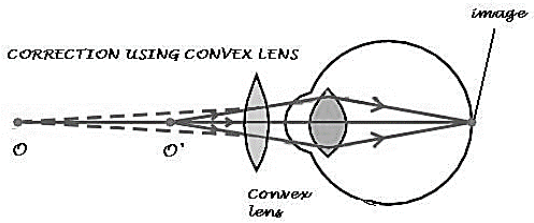
Any two diffs. – 2x1</td><td>4</td></tr>
</table>

	<table><tr><td>Pressure of blood</td><td>High pressure</td><td>Low pressure</td></tr></table> OR Mammals and birds have a double circulation system, which ensures complete separation of oxygenated and deoxygenated blood, allowing efficient oxygen delivery to body tissues. It helps maintain a high blood pressure in systemic circulation and supports their high metabolic rate and constant body temperature (warm-blooded nature).	1 1	
16.	A. (i) Vegetative propagation is a type of asexual reproduction in which new plants are produced from the vegetative parts of the parent plant such as root, stem, or leaf, without using seeds. Any two natural methods: By roots – e.g., Sweet potato, Dahlia By stem – e.g., Potato (tuber), Ginger (rhizome), Onion (bulb) Bryophyllum (leaf buds) (ii) Advantages of Vegetative Propagation Fast and reliable method – New plants grow faster and bear flowers and fruits earlier than those grown from seeds. Exact copies of parent plant – The offspring are genetically identical (clones) to the parent, so desirable traits (like flower colour, fragrance, or fruit quality) are preserved. (iii) Yes, they can produce fruits and seeds, Reason: The plants produced by vegetative propagation are genetically identical and fully mature. Once they grow and develop flowers just like in naturally grown plants. OR B: (i) Diagram Labelling (ii) Semen = sperms + fluids from seminal vesicle and prostate glands (iii) Vas deferens transports sperm from testes to the urethra.	½ ½ ½ 1 1 ½ 1 1 4 x ½ ½ + ½ 1	5

	SECTION B		Total
17	A. CH_3COOH and NaOH		1
18	B. Solid X is sodium bicarbonate and the gas evolved is CO_2		1
19	B. The litmus paper used is dry		1
20	B. Mercury		1
21	C. $Na + O_2 \rightarrow$		1
22	D. Decomposition of calcium carbonate		1
23	C. Solutions P and Q will turn red litmus solution blue.		1
24	A. Both A and R are true, and R is the correct explanation of A.		1
25	X- Sodium/ Potassium Y- Sodium Hydroxide / Potassium hydroxide $2Na + 2H_2O \rightarrow 2NaOH + H_2$ / $2K + 2H_2O \rightarrow 2KOH + H_2$	½ ½ 1	2
26	A. AgCl/ AgBr B. $2AgCl \xrightarrow{Sunlight} 2Ag + Cl_2$ / $2AgBr \xrightarrow{Sunlight} 2Ag + Br_2$ C. Decomposition Reaction	1 1 1	3
27	A. (i) P- Copper Y- Copper oxide (ii)  OR B. (i)Element **M** - electronic configuration **2,8,2** Atomic number = 12 → **Magnesium (Mg)** Element **X** - electronic configuration **2,6** Atomic number = 8 → **Oxygen (O)** Magnesium donates two electrons to oxygen . Hence, the compound formed is **Magnesium oxide (MgO) —** an **ionic compound.**  	Diagram- 1 Labelling 1 ½ ½ 1	3

	(ii) In the solid state, ionic compounds do not conduct electricity because the ions are held together in a rigid structure and cannot move freely. In the molten state, the strong electrostatic forces of attraction between the ions are overcome by heat, allowing the ions to move freely and conduct electricity.	½ ½	
28	A. Chlor-alkali process B. $2\ NaCl + 2\ H_2O \longrightarrow 2\ NaOH + Cl_2 + H_2$ C. De-greasing metals, soaps and detergents (any two uses) OR D. Bleaching powder, $CaOCl_2$ It is produced by the action of chlorine on dry slaked lime.	1 1 1 + 1 ½ + ½ 1	4
29	A i. X. $CH_3 - CH_2 - OH$ Y. $CH_2 = CH_2$ Z. $CH_3 - CH_3$ ii. $CH_3 - CH_2 - OH \xrightarrow[443K]{Con.\ H_2SO_4} CH_2 = CH_2$ iii. C_2H_6 burns in air and produces CO_2 and water along with the release of heat and light. iv. Hydrogenation of vegetable oil into vegetable ghee in presence of nickel catalyst. v. Sodium ethoxide, Hydrogen OR B i. Kiran's thinking is correct as substitution reactions occur in saturated hydrocarbons, hydrogen atoms are replaced with heteroatoms in saturated hydrocarbons. Whereas in unsaturated hydrocarbons an addition reaction occurs, simple molecules are added across double and/or triple bonds. ii.  iii. All the members of a homologous series have the same general molecular formula. The difference in molecular formulae between any two adjacent members of a homologous series is CH_2. The difference in molecular mass between any two adjacent members of a homologous series is 14. (any two)	½ ½ ½ 1 ½ 1 ½ + ½ 1 2 1+1	5

SECTION C

30.	B. Is scattered the least by smoke or fog		1
31.	A. I and II		1
32.	C. A is true, but R is false.		1
33.	A. I = P/V = 1000W/220V = 4.54A Thus, the fuse selected should be of 5A as the current it draws is 4.54A. **OR** B. Wire of 25 Ω cut into 5 equal parts, Resistance of each part = 5 Ω. Connected in parallel: $\frac{1}{Rp} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ R = **1 Ω**	½ 1 ½ ½ ½ 1	2
34	A. Convex lens (since a convex lens can give a virtual, erect, magnified image when the object is between the optical centre and focal point) B. $m = v / u$ + 2 = v / −12 cm, so: v = − 24 cm	½ ½ 1	2
35.	(i) The direction of the magnetic field produced by a current-carrying conductor at point P – into the plane of the paper. Point Q – out of the plane of the paper. (ii) As the magnetic field is inversely proportional to distance, the field at Q will be larger than the field at P. (iii) Right Hand Thumb Rule: Imagine that we are holding a current carrying straight conductor in our right hand such that the thumb points towards the direction of current. Then the fingers wrapped around the conductor shows the direction of the magnetic field lines.	½ + ½ ½ + ½ 1	3
36.	(i) He is suffering from hypermetropia. It can be corrected by using a convex lens. (ii)  (iii) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ f = 100/3 cm = 1/3 m P = 3D	½ + ½ 1 ½ ½	3
37.	i. Tungsten is used for making filaments in incandescent lamps because it has high resistivity and has high melting point. It can be made into thin wires. It has a low rate of evaporation at high temperatures. ii. It works based on Joule's law of heating. Usually, fuse wires are made of pure tin or of an alloy of tin and lead. A fuse wire has a low melting point and is always connected in series in the circuit. Whenever the current in the circuit exceeds a particular limit, the temperature of the fuse wire increases, and it melts due to its low melting point. Thus, the circuit breaks and protects the user and the device.	½ + ½ ½ ½ + ½ ½	3

38.	A. (i) Medium C (ii) Medium A B. It means that light travels 2.42 times faster in air/vacuum than in Diamond. C. $n_m = \frac{c}{v}$ = 3 x $\mathbf{10^8}$ / 2.5 x $\mathbf{10^8}$ = 1.2 D. $n_{gw} = n_g / n_w$ = (3/2) / (4/3) =9/8	½ ½ 1 ½ ½ 1 ½ ½ 1	4
39	A. Let Resistance of first bulb, $R_1 = V^2/ P_1 = 20^2/200 = 2\ \Omega$ Resistance of second bulb, $R_2 = V^2/ P_2 = 20^2/50 = 8\Omega$ Total resistance Rs = R1 + R2 = 10 Ω Supply voltage, V = 40V Current flowing in the circuit, I = V/Rs = 40/10 = 4A Power dissipated by the first bulb, $P_1 = I^2R_1 = 4^2$ x 2 =32W Power dissipated by the second bulb, $P_2 = I^2R_2 = 4^2$ x 8 = 128W The second lamp glows brighter as more power is dissipated by it. **OR** B. (i) $\frac{1}{Rp} = \frac{1}{12} + \frac{1}{6}$ $R_p = 4\ \Omega$ Effective resistance = 4 Ω + 8 Ω = 12 Ω (ii) Current through 8 Ω resistor = Total current in the circuit, I =V / R = 12 / 12 = 1 A Potential difference across parallel branch, V = I R_p = 1 x 4 = 4V Current through 12 Ω = V/R = 4/ 12 = 1/3 A = 0.33 A Current through 6 Ω = V/R = 4/ 6 = 2/3 A = 0.66 A	½ + ½ ½ ½ ½ + ½ ½ + ½ ½ ½ ½ ½ ½ ½ + ½ ½ ½ + ½ ½ + ½	5