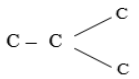
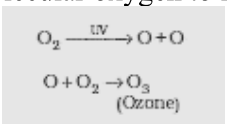
SECONDARY SCHOOL EXAMINATION, 2025

MARKING SCHEME

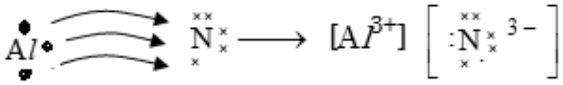
CLASS: X [SCIENCE (Subject Code–086)]

[Paper Code:31/5/2]

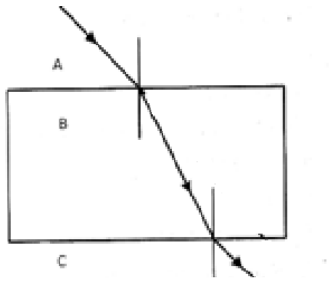
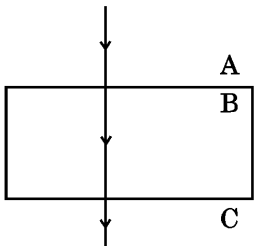
Maximum Marks: 80

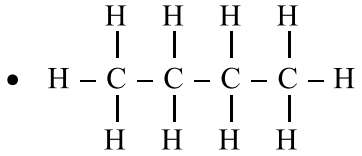
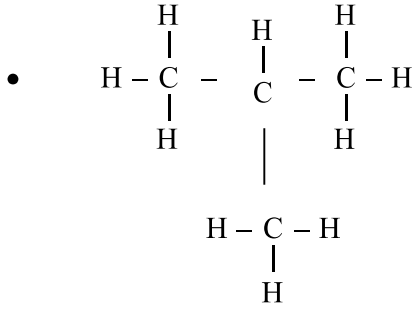
Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(B) / C – C – C – C ; 	1	1
2	(A) / Impure copper, pure copper, acidified copper sulphate solution	1	1
3	(B) / Disinfectant	1	1
4	(D) / 2, 2, 4, 1	1	1
5	(C) / (i) and (ii)	1	1
6	(C) / Zinc and hydrogen	1	1
7	(D) / Zinc	1	1
8	(B) / Hunger	1	1
9	(B)/ (iii), (ii), (iv), (i), (v)	1	1
10	(B) / Cytokinins and Abscisic acid	1	1
11	(C) / Fragmentation and regeneration	1	1
12	(B) / Between pole and focus of the mirror	1	1
13	(D) / Cytoplasm andMitochondria	1	1
14	(B) / The focal length of the eye lens has increased	1	1
15	(B) / Excessive use of disposable cups and plates	1	1
16	(C) /Lakes and Gardens	1	1
17	(B)/ Both Assertion (A) and Reason (R) are true, but Reason (R) is *not* the correct explanation of Assertion (A).	1	1
18	(D) / Assertion (A) is false, but Reason (R) is true	1	1
19	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
20	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
	SECTION B		
21	(a) Ozone (O_3) Excessive use of chlorofluorocarbons (CFC's) /Freons (b) The higher energy ultra violet radiations split apart molecular oxygen (O_2) into free oxygen (O)atoms. These atoms then combine with the molecular oxygen to form ozone. /  	½ ½ 1 2	

22	(A) Total resistance in the circuit $R = R_1 + R_2 + R_3 = 12\ \Omega$ Voltage of the battery = 6 V $\therefore I = \frac{V}{R} = \frac{6}{12} = 0{\cdot}5$ A $\therefore$ Potential difference across 6 Ω resistor = 0·5 A × 6 Ω = 3·0 V **OR** (B) $P_1 = I^2R$ $P_2 = (2I)^2R = 4I^2R$ [100% increase in current means current becomes 2I] $\therefore$ Increase in power dissipated = $P_2 - P_1 = 4I^2R - I^2R = 3I^2R$ $= 3P_1$ Percentage increase in power dissipated = $\frac{3P_1}{P_1} \times 100 = 300\%$	½ 1 ½ ½ ½ ½ ½	2
23	(a) Optical density of X is more than optical density of air because the ray coming from air bends towards the normal as it enters the medium X. (b) Speed of light through medium X is less than the speed of light through air because X is optically denser than air.	½+½ ½+½	2
24	(A) •Through the pores present in the walls of capillaries some amount of plasma, proteins and blood cells escape into intercellular spaces in the tissue to form the tissue fluid called lymph. •Lymph carries digested and absorbed fat from intestine/ drains excess fluid from extracellular space back into the blood. **OR** (B) (a) X- Bowman's capsule Function: collects the filtrate (b) It is because the nephron monitors how much excess water is there in the body and how much dissolved waste is to be removed or how much useful substances are retained by the body.	1 1 ½ ½ 1	2
25	(a) Provides a lower temperature than the normal body temperature for sperm formation. (b) The secretion of the glands helps in the transport of sperms and provides nutrition.	1 1	2
26	$Na_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(s) + 2\,NaCl(aq)$ (i) double displacement reaction. (ii) precipitation reaction.	1 ½+½	2

	SECTION C		
27	• Short circuiting occurs when the live wire and neutral wire of a domestic electric circuit come in direct contact with each other. • Damaged insulation of the live wire and neutral wire, Fault in the electrical appliance/ overloading (Any 2) • Due to abrupt increase in the current, the fuse wire will melt and break the circuit.	1 ½ +½ 1	3
28	r=0.01 cm= $0.01\text{x}10^{-2}$ m, R= 7 ohm ρ=$44\text{x } 10^{-6}\Omega$m A=$\pi r^2$ $R = \rho\frac{l}{A} \qquad \Rightarrow l = \frac{R\times A}{\rho}$ $l = \frac{7\Omega\times(0.01\times10^{-2})^2\times\frac{22}{7}\text{m}^2}{44\times10^{-6}\,\Omega m}$ $l = 0.5\times10^{-2}$m	½ ½ ½ 1 ½	3
29	(a) Concave lens $P = \frac{1}{f(m)} \Rightarrow f = \frac{1}{-0.25} \Rightarrow f = -4$ m (b) Myopia (c) Virtual , Erect Diminished	½ ½ 1 ½ ½	3
30	(A) A: Metal M will get corroded partly The part of metal M outside oil will get corroded whereas the part of the metal M inside the oil will not corrode as it cannot react with moist air. B: Metal M will not undergo corrosion. It is inside the oil and not exposed to moist air C: Metal M will not undergo corrosion as moisture is absent in test tube C. **OR** (B) (a) Al = 2, 8, 3 N = 2, 5  (b) Ionic compounds have strong force of attraction Between the positive and negative ions /Strong interionic forces of attraction/Strong electrostatic forces of attraction.	½+½ ½+½ ½+½ 2 1	3

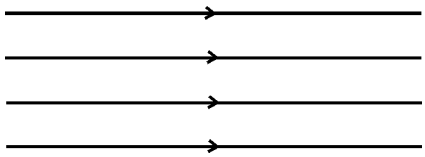
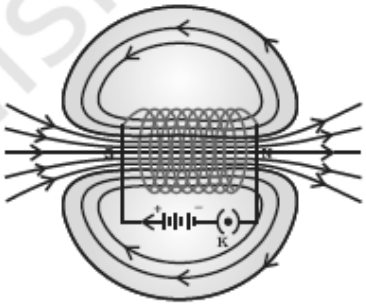
31	$Na_2CO_3.10H_2O$ When baking soda is heated sodium carbonate is obtained and recrystallisation of sodium carbonate gives washing soda. / $2\,NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2$ $Na_2CO_3 + 10\,H_2O \longrightarrow Na_2CO_3.10\,H_2O$ Uses: (i)In glass / soap / paper industry (ii)In manufacture of borax (iii)As cleansing agent for domestic purpose (iv)Removing permanent hardness of water (Any Two)	1 1 ½ +½	3
32	<table><tr><th>Gamete</th><th>Zygote</th></tr><tr><td>(i) Germ cells/sex cells</td><td>(i) Formed by fusion of male and female gamete</td></tr><tr><td>(ii) They have half the number of chromosome (one set) and half the amount of the DNA as compared to non-reproductive cells /Haploid(n)</td><td>(ii) They have 2 set of chromosomes. / Diploid(2n)</td></tr></table> Significance : Gamete formation is required for sexual reproduction to restore the number of chromosomes and DNA content in next generation. Zygote : it grows and develops into a new organism which has same amount of DNA as that of a parent	2 ½ ½	3
33	(a) Amount of dissolved oxygen is fairly low in water as compared to the amount of oxygen in air. (b) Rings of cartilage ensure that air passage does not collapse in absence of air (c) Due to lack of oxygen in our muscle cells	1 1 1	3
	SECTION D		
34	(A) (a) (i) Speed of light in A and B is same whereas the speed of light in C is greater than that of A and B. (ii) Optical density of A and B is same whereas optical density of C is less than that of A and B. Since the ray of light does not bend while passing from A to B the refractive indices of A and B are same and since it bends away from the normal while passing from B to C the refractive index of C is less than that of A and B. / Refractive index of a medium is inversely proportional to the speed of light in that medium.	1 1 1	

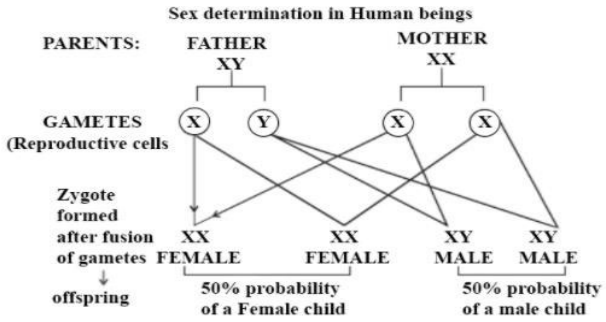
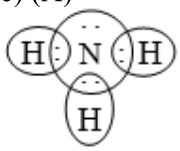
	(b) (i) Oblique Incidence  (ii) Normal Incidence  **OR** (B) (a)2f = 40 cm $\Rightarrow$ f = 20 cm Reason: When an object is placed at 2f (– 40 cm) of a convex lens its real image formed at 2f (+ 40 cm) on the other side of the lens. (b) $m = \frac{v}{u} = \frac{+60\ cm}{-30\ cm} = -2$ (c) Observation No.1- image is virtual and erect Observation No.2 - image is real and inverted	1 1 1 1 1 1 1 1	5
35	(A) (a) A series of carbon compounds in which the same functional group substitutes for hydrogen in a carbon chain. / A sequence of carbon compounds with same general formula and similar chemical properties • HCHO, CH_3CHO , C_2H_5CHO (Any two) (b) • Add a spatula full of $NaHCO_3$ / Na_2CO_3 in a test tube containing unknown solution and shake well	1 1 1	

	• If evolution of a colourless gas (CO_2) takes place the sample is carboxylic acid otherwise it is alcohol. $NaHCO_3 + CH_3COOH \longrightarrow CH_3COONa + CO_2 + H_2O$ **OR** (B) (a) •Structural isomers : Carbon compounds with same molecular formula but having different structures. •  •  (b) • Compound $X - C_2H_4$ will show addition reaction • X is Unsaturated hydrocarbon / contains double bond (i) $C_2H_4 + H_2 \xrightarrow{Nickel\ /Palladium\ as\ catalyst} C_2H_6$ (Alkene) (Alkane) (ii) In the hydrogenation of vegetable oils (Vegetable ghee industry)	1 1 1 ½ ½ 1 1 ½ 1	5
36	(A) (a)(i) Iodine is necessary for the thyroid gland to make thyroxin hormone, its deficiency causes goitre. (ii)Deficiency of growth hormone in childhood causes dwarfism. (iii)Secretion of testosterone during puberty in males. (b) • Hormones or chemical compounds can potentially reach all cells of body steadily and persistently. • Hormones help to coordinate growth, development and responses to environment. **OR** (B) (a) (Any two)	1 1 1 1 1	

VOLUNTARY ACTION	INVOLUNTARY ACTION
Thinking is involved	Does not involve thinking
Controlled by Forebrain	Controlled by Hindbrain
It occurs according to our will	It does not occur according to our will (Any other)

1+1

	(b) • Reflex action: Sudden action in response to stimulus in the environment. •Stimulus ⟶ Receptors ⟶ Sensory Neurons ⟶ Spinal Cord/ Brain ↓ Effector muscle/Gland ⟵ motor neuron	1 2	5
	SECTION E		
37	(a) The direction of the magnetic field is taken to be the direction in which a north pole of the compass needle moves inside it. (b)Closer the field lines stronger is the magnetic field. (c) **(A)** (i) It would mean that at the point of intersection, the compass needle would point towards two directions, which is not possible. (ii)  Equidistant parallel lines (Award marks if magnetic field is shown through a solenoid) **OR** (B)•  • Uniform Magnetic Field	1 1 1 1 1 1	4
38	a) Chromosomes carry genes which control the traits of an organism. /Chromosomes contain information for inheritance of features from parents to next generation in form of DNA (deoxyribonucleic acid) molecules (b) Men have one normal sized X chromosome while Y chromosome is short.	1 1	

	(c) (A)  **OR** (B) • In a few reptiles; the temperature at which fertilized eggs are kept determine the sex of offspring. • In snails; the individual can change sex, indicating that is not genetically determined.	2 1 1	4
39	(a) It shall gain or share 2 electrons to attain its nearest noble gas configuration. (b) (i) The number of single covalent bonds- 10 (ii)The number of double covalent bonds-1 (c) (A)  **OR** (B) Carbon cannot gain or lose 4 electrons to complete its octet as a large amount of energy is involved. / (i) It could gain four electrons forming C^{4-} anion. But it would be difficult for the nucleus with six protons to hold on to ten electrons. (ii) It could lose four electrons forming C^{4+} cation. But it would require a large amount of energy to remove four electrons leaving behind a carbon cation with six protons in its nucleus holding on to just two electrons.	1 ½ +½ 2 2	4