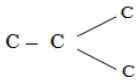
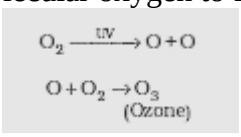
EXAMINATION, 2025

SOLUTIONS

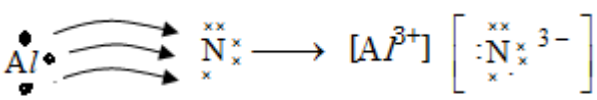
CLASS: X [SCIENCE (Subject Code–086)]

[Paper Code:31/5/2]

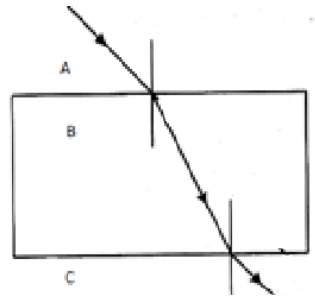
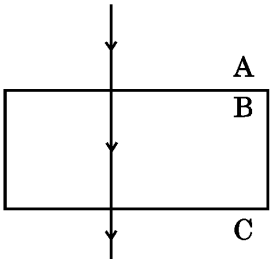
Maximum Marks: 80

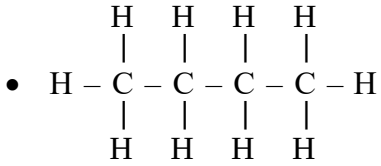
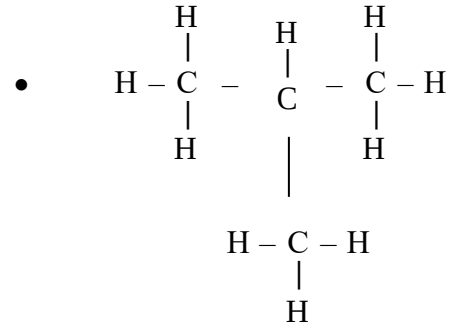
Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(B) / C – C – C – C ; 	1	1
2	(A) / Impure copper, pure copper, acidified copper sulphate solution	1	1
3	(B) / Disinfectant	1	1
4	(D) / 2, 2, 4, 1	1	1
5	(C) / (i) and (ii)	1	1
6	(C) / Zinc and hydrogen	1	1
7	(D) / Zinc	1	1
8	(B) / 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 = $0{\cdot}5\ A \times 6\ \Omega = 3{\cdot}0$ 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	$Na_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(s) + 2\,NaCl(\text{aq})$ (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=44x $10^{-6}\Omega$m A=πr^2 $R = \rho\frac{l}{A} \quad \Rightarrow l = \frac{R\times A}{\rho}$ $l = \frac{7\Omega\times(0.01\times10^{-2})^2\times\frac{22}{7}m^2}{44\times10^{-6}\,\Omega m}$ $l = 0.5\times10^{-2}$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	

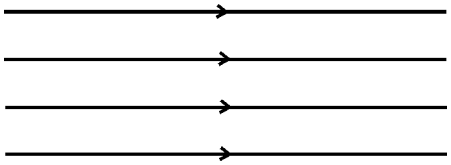
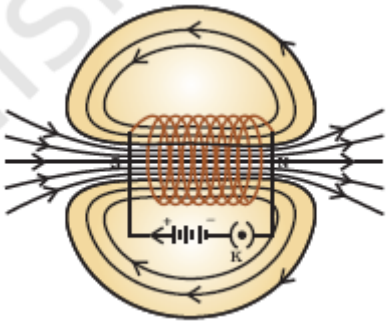
	(b) (i) Oblique Incidence  	1	
	(ii) Normal Incidence  	1	
	OR		
	(B) (a)2f = 40 cm $\Rightarrow$ f = 20 cm	1	
	Reason: When an object is placed at 2f (– 40 cm) of a convex lens its real image formed at 2f (+ 40 cm) on the other side of the lens.	1	
	(b) m = $\frac{v}{u} = \frac{+60\ cm}{-30\ cm}$ = – 2	1	
	(c) Observation No.1- image is virtual and erect	1	
	Observation No.2 - image is real and inverted	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	1	
	• HCHO, CH_3CHO , C_2H_5CHO (Any two)	1	
	(b) • Add a spatula full of $NaHCO_3$ / Na_2CO_3 in a test tube containing unknown solution and shake well	1	

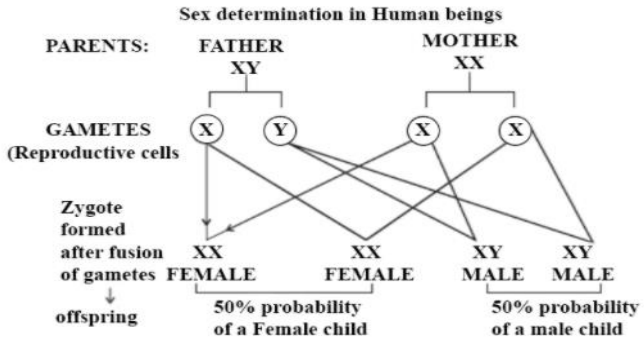
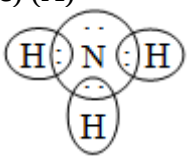
	• If evolution of a colourless gas (CO_2) takes place the sample is carboxylic acid otherwise it is alcohol. $NaHCO_3 + CH_3COOH \longrightarrow CH_3COONa + CO_2 + H_2O$ **OR** (B) (a) •Structural isomers : Carbon compounds with same molecular formula but having different structures. •  •  (b) • Compound 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 ½ 1 ½	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)	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)

(Any two) 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

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2025
SUBJECT : SCIENCE (Q.P. CODE 31/5/3)

General Instructions: -

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	**"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC."**
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.**
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X' be marked. Evaluators will not put right **(✓)**while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks

	should be retained and the other answer scored out with a note **"Extra Question"**.
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks 80 (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- ● Leaving answer or part thereof unassessed in an answer book. ● Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. ● Wrong question wise totaling on the title page. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for Spot Evaluation**" before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.