Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Supplementary Examination, July 2024
SUBJECT NAME: SCIENCE **SUBJECT CODE : 086**
PAPER CODE : 31/S/2

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 News Paper/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 delibration 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).
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- 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. ● Leaving answer or part thereof unassessed in an answer book. ● ● 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 un assessed 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.

SECONDARY SCHOOL SUPPLEMENTARY EXAMINATION, July 2024

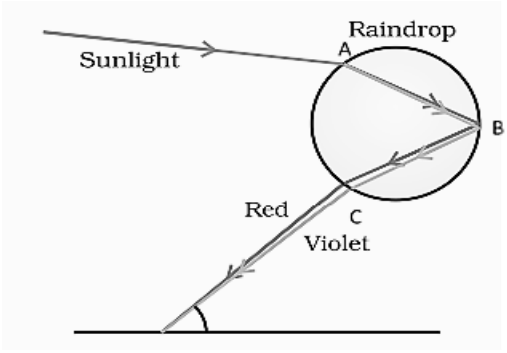
MARKING SCHEME

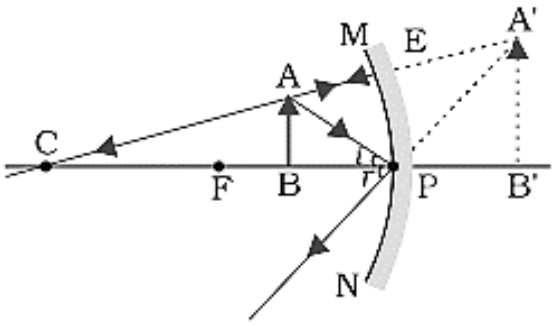
CLASS : X SCIENCE (Subject Code–086)

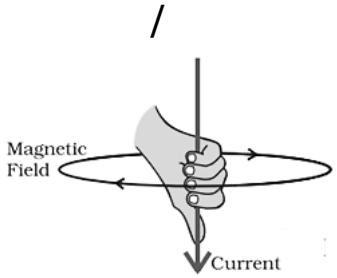
[Paper Code: 31/S/2]

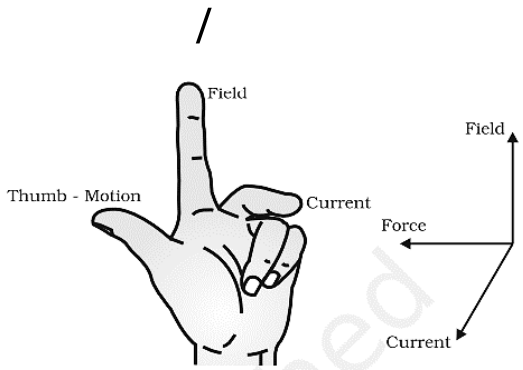
Maximum Marks: 80

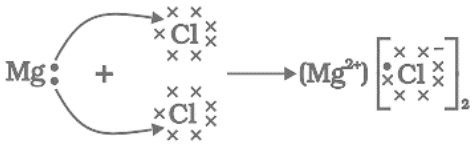
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(C)	1	1
2	(D)	1	1
3	(A)	1	1
4	(B)	1	1
5	(B)	1	1
6	(B)	1	1
7	(D)	1	1
8	(D)	1	1
9	(A)/(C)	1	1
10	(D)	1	1
11	(D)	1	1
12	(D)	1	1
13	(B)	1	1
14	(C)	1	1
15	(C)	1	1
16	(C)	1	1
17	(B)	1	1
18	(C)	1	1
19	(A)	1	1
20	(B)	1	1
	SECTION B		
21.	• Solutions B and C • Due to the presence of free ions.	½, ½ 1	2
22.	(a) • X – Sensory neuron • Y – Motor neuron • Functions: X : to carry message from skin/sense organs to brain / spinal cord Y : to carry response from brain/spinal cord to muscle / body parts	 ½ ½ ½ ½	

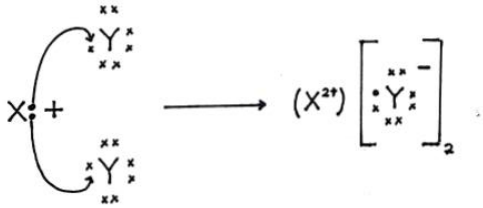
	OR **(b)** (i) Cerebellum/Hind brain (ii) Medulla/Hind brain (iii) Fore-brain (iv) Cerebrum/ Fore-brain	½ × 4	2
23.	• Two ways 1. Errors in DNA copying mechanism 2. Sexual reproduction • Importance: (any one of following) 1. Helps a species to survive 2. Helps an organism to adapt to the changing environment 3. Forms the basis of evolution (or any other)	½ ½ 1	2
24.	(a)  *[Fig 10.8 page 16]* Diagram Correct labelling of A,B and C **OR** (b) • Ciliary muscles • Ciliary muscles adjust/change the focal length of eye lens by changing the curvature of eye lens.	½ 1½ 1 1	2

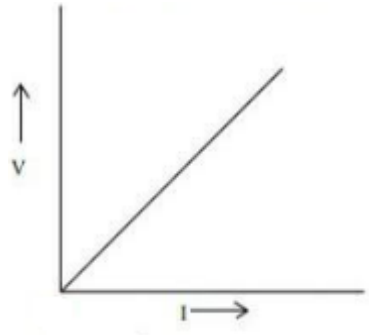
25.	 [P: Pole, F: Principal Focus, AB : Object, A′B′: Image] *[Diagram from NCERT fig 9.7(f) page 140]* Ray diagram Labelling of pole and principal focus Direction of rays	1 ½ ½	2
26.	• Phytoplankton ⟹ Zooplankton ⟹ Small fish ⟹ Large fish • Primary Consumer: - Zooplankton • Tertiary Consumer: - Large fish (or Any other Example of aquatic food chain)	1 ½ ½	2
	SECTION C		
27.	(a) • Dominant trait, • Bb (b) (i) 75% (ii) 25% Two copies of the recessive traits (genes) are required for its expression / reappearance.	½ ½ ½ ½ 1	3
28.	(a) (i) • CO_2 • Lime water turns milky. • $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$ (ii) • Milky colour turns to colourless in excess of CO_2. • Formula: -$Ca(HCO_3)_2$ **OR** (b) • $NaCl + H_2O + CO_2 + NH_3 \rightarrow NaHCO_3 + NH_4Cl$ Baking soda • Baking soda is mixed with a mild edible acid such as tartaric acid. • When baking powder is heated or mixed in water then Carbon dioxide produced during the reaction makes bread or cake to rise.	½ ½ 1 ½ ½ 1 ½ ½	

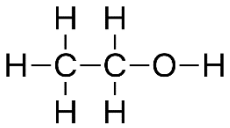
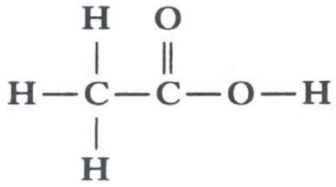
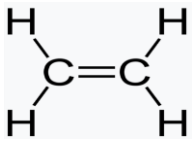
	• $NaHCO_3 + H^+ \longrightarrow CO_2 + H_2O$ + Sodium salt of acid	1	3
29	(a) Function of Ovary: (any one function) • Formation of female germ cells or eggs. • Secretion of Oestrogen. Function of Testes: - (any one function) • Formation of male germ cells/sperms. • Secretion of testosterone. (b) (i) Sperm formation requires a lower temperature than the normal body temperature. (ii) To receive, nurture and nourish the growing embryo.	½ ½ 1 1	3
30.	(a) $Fe(s) + CuSO_4(aq) \rightarrow FeSO_4(aq) + Cu(s)$ (Copper sulphate) (Iron sulphate) Blue Light Green (any other suitable example) (b) • $CuO(s) + H_2(g) \xrightarrow{Heat} Cu(s) + H_2O(g)$ • Redox reaction	 1 1 1	3
31.	(a) (i) Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field. This is known as the right-hand thumb rule.  *[Fig 12.7, page 200 of NCERT]* ***Note : Award full marks if explained diagrammatically.*** (ii) Stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular . If the first finger points in the	 1	

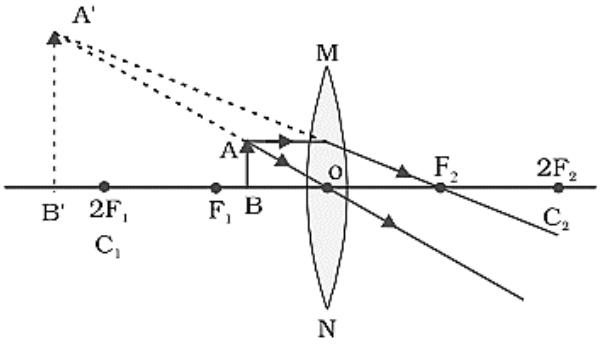
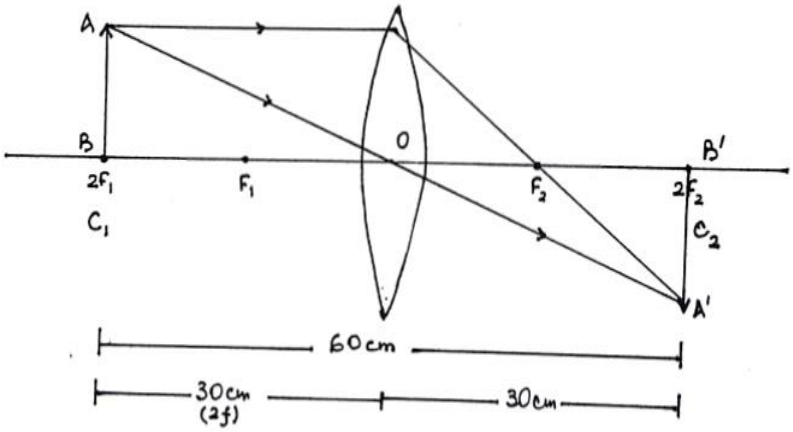
	direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.  *[Fig 12.13, page 203 of NCERT]* ***Note : Award full marks if explained diagrammatically.*** (b) Out of plane of the paper.	1 1	3
32.	(i) R = 2 Ω + 4 Ω + 6 Ω = 12 Ω (ii) $I = \frac{V}{R} = \frac{6V}{12\Omega} = 0.5$ A (iii) V= IR = 0.5A × 4Ω = 2V	1 1 1	3
33	(a) ∠ PEN= ∠ i / angle of incidence ∠ FEN'= ∠ r / angle of refraction ∠ SFM= ∠ e / angle of emergence ∠ FGH= ∠ D / angle of deviation (b) At face, AC of the prism $\frac{\sin i}{\sin r} = \frac{\sin \angle EFM'}{sin\angle SFM} = \frac{2}{3}$ ∴ $\frac{\sin \angle SFM}{sin\angle EFM'} = \frac{3}{2}$ Reason: Path of light is reversed at the face AC of the prism. ***Note:- Give one mark for part (b) to all students as in question given,*** $\frac{sin \angle SFM}{sin\angle EFM}$ ***is wrong. It should be*** $\frac{\sin \angle SFM}{sin\angle EFM'}$	½ ½ ½ ½ 1	3
	SECTION D		
34.	(a) (i) A – Mouth/buccal cavity	½	

	B – Stomach C – Pancreas Enzymes A – Salivary Amylase B – Pepsin C – Trypsin/Lipase (ii) • Digested food is taken up by the walls of the small intestine/ villi • The food is absorbed here • Blood vessels in the villi take absorbed food to each and every cell of the body. • Utilisation of this food is done to obtain energy, building up new tissues and repair of old tissues. (if explained in paragraph award full marks) **OR** (b) (i) A – Pulmonary artery B – Aorta C – Capillaries **Functions:** A – Carries deoxygenated blood from heart to lungs. B – Carries oxygenated blood to different parts of the body. C- Exchange of material between blood and surrounding parts. (ii) • To prevent oxygenated and deoxygenated blood from mixing • This allows a highly efficient supply of oxygen to the body of birds to maintain their body temperature.	½ ½ ½ ½ ½ 2 ½ ½ ½ ½ ½ ½ 2	5
35.	(a) • X : 2,8,2 • Y: 2,8,7 • (Any one of the following below formations)  /	½ ½	

		1	
	• Name: Magnesium chloride	½	
	• Formula : $MgCl_2/XY_2$	½	
	• The compound will dissociate into ions / ions will move freely to the opposite electrodes/electrolysis will occur.	1	
	• (i) Cathode: Mg^{2+} / Magnesium ion/Cation	½	
	(ii) Anode: Cl^- /Chloride ion/Anion	½	
	OR		
	(b) (i)		
	• Zinc, Iron, Lead, Copper (any two)	½ , ½	
	• Zinc is more reactive than Iron/Iron is more reactive than Copper/Lead is more reactive than Copper (or any other suitable combination)	1	
	• Demonstration: 1. Put iron nail in a solution of copper sulphate taken in a test tube. 2. After sometime blue colour of $CuSO_4$ fades. (Any other relevant activity)	1	
	(ii)		
	• Calcination	½	
	• Reduction using Carbon	½	
	Chemical Reactions		
	1. $ZnCO_3 \xrightarrow{Heat} ZnO + CO_2$	½	
	2. $ZnO + C \longrightarrow Zn + CO$	½	5
36	(a) (i)		
	• Ohm's law: The potential difference, V, across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature remains the same. / $V \alpha I$	1	

	• 	1	
	(ii)Here l = 1km = 1000 m R= 200Ω, A = 40 x 10^{-8} m^2	½	
	$\rho = \frac{R \times A}{l}$	½	
	$= 200\Omega \times \frac{40 \times 10^{-8} m^2}{1000 m}$	1	
	$= 8 \times 10^{-8}\ \Omega$ m	1	
	OR		
	(b) (i) $R_s = R_1 + R_2 + R_3$	1	
	$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$	1	
	(I) • Both have same reading. • As both are connected in series and in series current remains same.	½ ½	
	(II) $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ $= \frac{1}{30} + \frac{1}{30} + \frac{1}{30}$		
	=10 Ω (III)	1	

	I= $\frac{V}{R} = \frac{3V}{30\Omega} = \frac{1}{10}$ = 0.1A	1	5
	SECTION E		
37.	(a)  / CH_3CH_2OH	1	
	(b) Carbon dioxide and water / CO_2 and H_2O	½, ½	
	(c) (i) • Ethanol is oxidised to ethanoic acid.	½	
	•  / CH_3COOH	1	
	• Acts as an oxidizing agent.	½	
	OR		
	(c) (ii) • Ethene/ C_2H_4 is formed.	½	
	•  / $CH_2 = CH_2$	1	
	• Acts as a Dehydrating agent.	½	4
38.	(a) Sexual – Seed Asexual - Roots/stem/leaves. .	½ ½	
	(b) (i) Rose/Jasmine (or any other) (ii) Grapes/orange/banana (or any other)	½ ½	
	(c) (i) (Any two of the following) • Production of genetically similar plants • Propagated plants bear fruits and vegetables earlier than those produced from seeds. • Propagation of plants that have lost capacity to produce seeds. (Any other)	1, 1	
	OR		

	(c) (ii) Put the small pieces of potato into containing notches or buds in moist cotton for few days and observe. Notches or buds will give rise to fresh green shoots and roots.	2	4
39	(a) More than 2cm and less than 4cm from the optical centre of the lens (b) Less than 6cm from the optical centre of the lens (c) (i)  OB = 12 cm OF = 18 cm A′B′ : Image *[Fig. 9.16 (f) page 155 NCERT]* ***(Deduct ½ mark if direction of rays is not shown)*** **OR** (c) (ii) As per the information given in the question, the lens lies at the centre of the object placed and image formed.  The position of the object is at $2F_1$ therefore object distance = image distance = 2f ∴ 2f + 2f = 60 cm 4f = 60	1 1 2 1	

	f = 15cm ∴ The focal length of the lens = 15 cm **Note : Do not deduct marks if diagram is not drawn.**	1	4

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