Marking Scheme
Strictly Confidential
Secondary School Examination, 2024
SUBJECT NAME SCIENCE (086) (Q.P. CODE 31/5/1)

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 0-80 (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.

MARKING SCHEME

Secondary School Examination, 2024

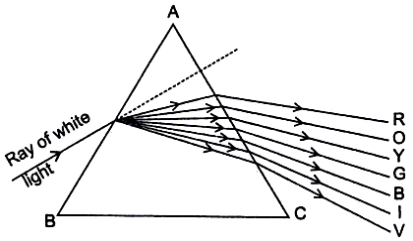
SCIENCE (Subject Code–086)

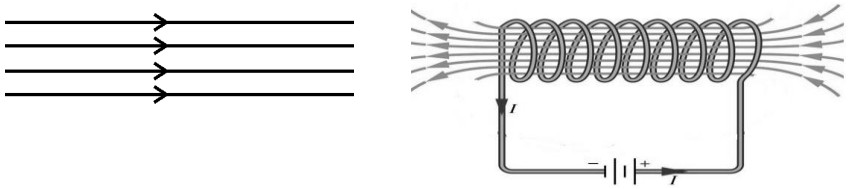
[Paper Code: 31/5/1]

Maximum Marks: 80

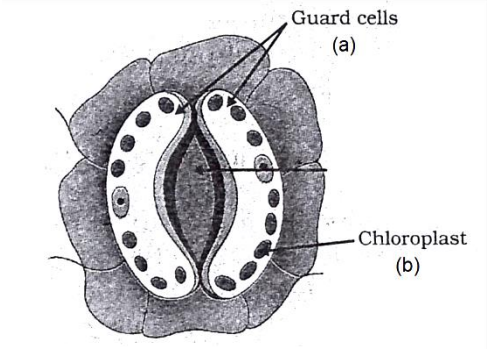
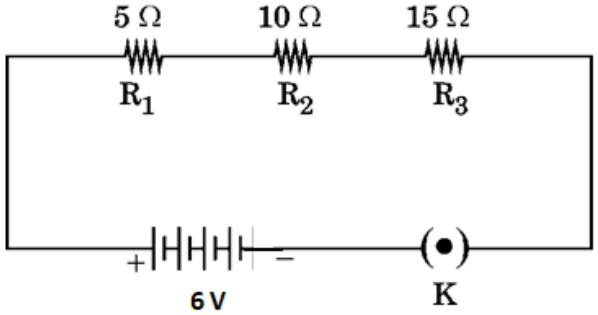
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(C) /2,2,4	1	1
2	(D) / Fe_2O_3 + 3 CO→ 2 Fe + 3 CO_2	1	1
3	(A) /Calcium Phosphate	1	1
4	(C)/ 7	1	1
5	(B) / Al, Al_2O_3	1	1
6	(D) / Translocation	1	1
7	(C)/ Receptors in skin →Sensory neuron →Relay neuron → Motor neuron→ Effector muscle in arm.	1	1
8	(A) / Nose	1	1
9	(C)/ It has a very small area for glucose and oxygen to pass from mother to the embryo	1	1
10	(A) / (i) and (ii)	1	1
11	(C) / The brightness of the image will reduce	1	1
12	(B) / Refraction, Dispersion and internal reflection	1	1
13	(A) / Red	1	1
14	(C) / A solenoid	1	1
15	(A) / both pointing into the plane of the paper.	1	1
16	(D)/ Crop land ecosystem	1	1
17	(A) / Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).	1	1
18	(D) / Assertion (A) is false, but Reason (R) is true.	1	1
19	(B) / Both Assertion (A) and Reason (R) are the true , but Reason (R) is not a correct explanation of Assertion (A).	1	1
20	(B) / Both Assertion (A) and Reason (R) are the true , but Reason (R) is not a correct explanation of Assertion (A).	1	1
	SECTION B		
21	(a) • Copper Oxide • Black $2Cu + O_2 \xrightarrow{Heat} 2CuO$ **OR** (b) $BaCl_2$ (aq)+ Na_2SO_4 (aq)→ $BaSO_4$ (s)+ 2NaCl (aq) Ba^{2+}, SO_4^{2-}	½ ½ 1 1 ½+½	2

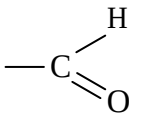
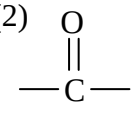
22	• Low melting points and boiling points – Weak intermolecular forces of attraction. • Non-conductors of electricity – Bonding in these compounds does not give rise to any ions. / Covalent bonds or sharing of electrons do not form any charged particles.	1 1	2
23	(a) • Formation of lactic acid in muscles causes cramps. • Aerobic respiration takes place in the presence of oxygen whereas the respiration taking place above is due to lack of oxygen. / End products of aerobic respiration are $CO_2 + H_2O +$ Energy whereas in the above case, Lactic acid + Energy is formed. **OR** (b) • Tissue fluid / Extracellular fluid Functions : i. Carries digested and absorbed fats from the intestine. ii. Drains excess fluid from extracellular space back into the blood. iii. Fight against infections. **(Any two)**	1 1 1 ½ + ½	2
24	• Plasmodium: Multiple fission- A single cell divides into many daughter cells simultaneously. • Leishmania: Binary fission- Splitting of one cell into two daughter cells in definite orientation.	½ +½ ½+½	2
25	(a) The sun light is converged at a point by convex lens which generates heat causing the paper to burn. (b) •Principal Focus •Real image of the Sun.	1 ½ ½	2
26	$Q = I \times t$ $\therefore t = \frac{500\ C}{25 / 1000\ A}$ $= 20000\ s$	½ ½ 1	2
	SECTION C		
27	• $Fe(s) + CuSO_4\ (aq) \rightarrow FeSO_4(aq) + Cu(s)$ • Displacement reaction – A reaction in which a more reactive metal displaces a less reactive metal from its salt solution. • Zinc, Aluminium, Calcium, Magnesium **(Any two)**	1 ½ +½ ½ ,+½	3

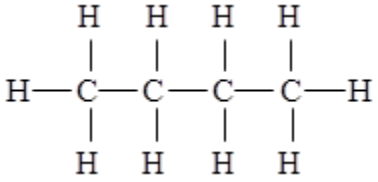
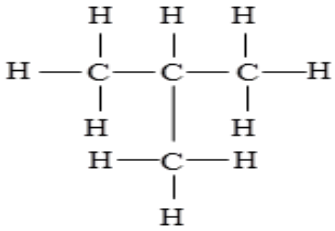
28	• Cinnabar • Sulphide ore • $2HgS + 3O_2 \xrightarrow{Heat} 2HgO + 2SO_2$ • $2HgO \xrightarrow{Heat} 2Hg + O_2$	½ ½ 1 1	3
29	(i) •Growth hormone •Secreted by pituitary gland. •It stimulates growth in all organs. (ii) •Thyroxin •Secreted by thyroid gland. •It regulates carbohydrate, protein and fat metabolism for body growth.	½ x 3 ½ x 3	3
30	(a) •All Plants Tall •Gene combination: Tt (b) It is a recessive trait / it cannot be expressed in presence of dominant trait. (c) Tall : Short 3:1 Conclusion: Tall trait is dominant and short trait is recessive.	½ ½ 1 ½ ½	3
31	(a) (i) • Hypermetropia • Ciliary muscles/ eye lens (ii) • Focal length of the eye lens is too long. • Eyeball becomes too small. (iii) Converging lenses/ convex lens They provide the additional focussing power required for forming the image on the retina./ Helps to decrease the focal length of the eye lens. **OR** (b) The splitting of white light into its constituent colours is called dispersion. Cause: Different colours of white light bend through different angles with respect to incident ray.  	½ ½ ½ ½ ½ ½ 1 1 1	3

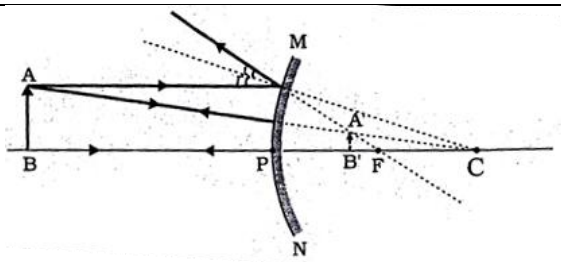
32	(a) • It gets magnetised • Electromagnet. • It behaves as a magnet only when current passes through the solenoid. (b)  **(Any one diagram)** • This pattern indicates that the magnetic field is uniform.	½ ½ ½ 1 ½	3
33	<table><tr><th>Food chain</th><th>Food web</th></tr><tr><td>It is a series of organisms feeding on one another at various levels</td><td>It is a network of interconnected food chains / series of branching lines which provides a number of feeding connections amongst different organisms.</td></tr></table> • Population of grass/ first trophic level will increase. • Population of tiger/ third trophic level will decrease.	1+1 ½ ½	3
	SECTION D		
34	(a) (i) The molecules of water of crystallisation in ferrous sulphate crystals get evaporated on heating. (ii) Green ⟶ White (iii) Seven / ($FeSO_4 \cdot 7H_2O$) (I) $CuSO_4 \cdot 5H_2O$ (II) $Na_2CO_3 \cdot 10H_2O$ (iv) • On heating gypsum ($CaSO_4 \cdot 2H_2O$) at 373 K it loses water molecules/ $CaSO_4 \cdot 2\,H_2O \xrightarrow[373\ K]{\Delta} CaSO_4 \cdot \frac{1}{2}\,H_2O + 1\frac{1}{2}\,H_2O$ Two uses of plaster of Paris: • Making toys / material for decoration • Supporting fractured bones **(or any other)**	1 ½ ½ ½ ½ 1 ½ + ½	

	OR (b) (i) X-Tartaric acid Y-Baking soda Z- Baking powder Y- $NaHCO_3$ (ii) $NaCl + H_2O + CO_2 + NH_3 \longrightarrow NH_4Cl + NaHCO_3$ $NaHCO_3 + H^+ \longrightarrow CO_2 + H_2O$ + Sodium salt of acid CO_2 released during heating makes the cake soft and spongy (iii) Magnesium hydroxide; $Mg(OH)_2$	½ ½ ½ ½ 1 ½ ½ 1	5
35	(a) • Take two healthy potted plants, A and B of nearly the same size. • Keep them in darkness for three days. (Destarch the plant) • Place a watch glass containing potassium hydroxide by the side of potted plant A but not in potted plant B. • Cover both the plants with separate bell jars and seal the bottom of the jars with Vaseline. • Keep both the plants in sunlight for two hours. • Pluck one leaf each from both the plants and test for the presence of starch with iodine solution. • <u>Observation</u>: The leaf of the potted plant A with KOH did not turn blue – black. The leaf of the potted plant B turns blue. • <u>Conclusion</u>: KOH absorbs CO_2 so photosynthesis did not occur in potted plant A. **OR** (b) (i) In set up (I) lime water turns milky in more time as compared to set up (II) because the air we exhaled contains high percentage of CO_2 as compared to atmospheric air.	½ x 6 1 1 1,1	

	(ii)  Open Stomatal Pore Two labellings : (I) Guard Cells (II) Chloroplast Two functions performed by stomata : • Gaseous exchange • Transpiration	1 ½ ½ ½ ½	5
36	(a) (i) • Current becomes one-third of its initial value. • Ohm's Law The potential difference across the ends of a conductor is directly proportional to the current flowing through it, provided its temperature remains the same. (ii)  Total Voltage = V = 4 × 1·5 V = 6 V Total resistance, R(s) = $R_1 + R_2 + R_3$ = 5 Ω + 10 Ω +15 Ω = 30 Ω (I) Current, $I = \frac{V}{R} = \frac{6\ V}{30\ \Omega} = 0{\cdot}2\ A$ (II) V = IR = 0·2 A × 10 Ω = 2 V	½ ½ 1 1 1 1	

	OR (b) (i) When 1 joule of work is done to move a charge of 1 coulomb from one point to the other. (ii) d = 0·2 mm = 2×10^{-4} m; R = 14 Ω $\rho = 1{\cdot}6 \times 10^{-8}$ Ω m; A = $\pi d^2/4$ $R = \frac{\rho l}{A} = \frac{4\rho l}{\pi d^2}$ or $l = \frac{\pi d^2 R}{4\rho}$ $l = \frac{22}{7} \times \frac{(2\times10^{-4})^2}{4\times1{\cdot}6\times10^{-8}} \times 14$ = 27·5 m When the diameter is doubled, d' = 2d A' = 4A $\frac{R'}{R} = \frac{A}{A'}$ or $R' = \frac{RA}{A'} = \frac{RA}{4A}$ $\frac{R'}{14} = \frac{A}{4A}$ R' = 3·5 Ω Change (14·0 – 3·5) = 10·5 Ω	1 ½ ½ 1 ½ 1 ½	5
	SECTION E		
37	(a) Compounds formed by carbon and hydrogen only. (b) Tetravalency and Catenation (c) (i) (1)  (2)  $CH_3COOH + C_2H_5OH \xrightarrow{Acid} CH_3COOC_2H_5 + H_2O$ Ester **OR** (c) (ii) Compounds with identical molecular formula but different structures	1 1 ½ + ½ 1 1	

	Two isomers of butane C_4H_{10}  	½ + ½	4
38	(a) **Self-pollination**: Transfer of pollen grains from anther to the stigma of the same flower. **Cross-pollination**: Transfer of pollen grains from the anther of one flower to the stigma of another flower.	1	
	(b) Petals, they dry and fall off.	½ + ½	
	(c)(i) Fusion of male and female gametes to form a zygote Ovule – Seed, Ovary – fruit	1 ½ ½	
	OR		
	(c) (ii) Future shoot – Plumule, Future root – Radicle Cotyledon – Stores food.	½ ½ 1	4
39	(a) It is straight line passing through the pole and centre of curvature of a concave mirror.	1	
	(b) Radius of curvature ,R= 20 cm	1	
	(c) (i) u = –10 cm, f = +15 cm $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{15} - \frac{1}{-10}$ $\frac{1}{v} = \frac{1}{6}$ $\Rightarrow$ v = + 6 cm	½ ½ 1	
	OR		
	(c) (ii) Convex mirror / Diverging mirror	½	

	 **[Note: Deduct ½ mark if direction of rays is not shown]**	1 ½	4

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