Marking Scheme
Strictly Confidential
Secondary School Examination, 2024
SUBJECT NAME SCIENCE (086) (Q.P. CODE 31/3/2)

General Instructions: -

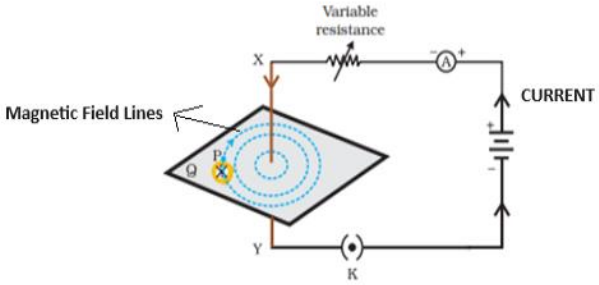
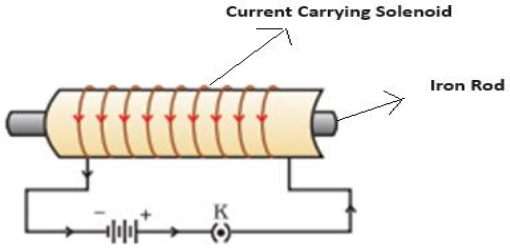
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested 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".

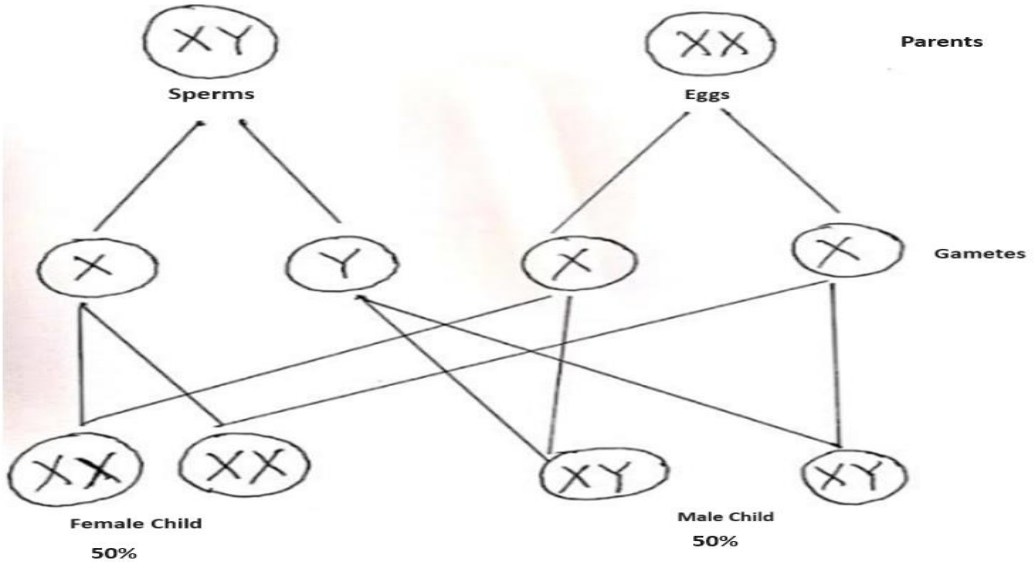
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks ___0-80_____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner 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.

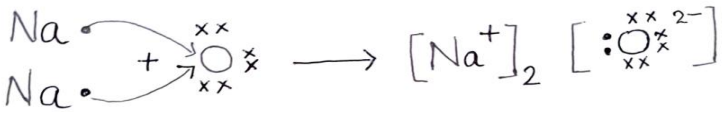
MARKING SCHEME
Secondary School Examination, 2024
SCIENCE (Subject Code–086)
[Paper Code: 31/3/2]

Maximum Marks: 80

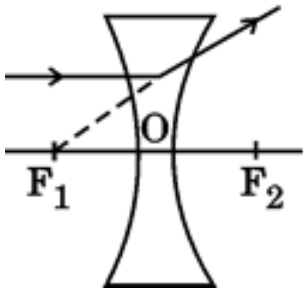
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(A) / Washing Soda	1	1
2	(B) / $CaO + H_2O \rightarrow Ca(OH)_2$	1	1
3	(A) / Quick lime	1	1
4	(B) / Turmeric and litmus	1	1
5	(B) / $C_7 H_{14}$	1	1
6	(C) / $CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$	1	1
7	(A) / 1, 6, 2 and 3	1	1
8	(D) / 4D and 2L	1	1
9	(D) / Reduce CFC production	1	1
10	(D) / They reproduce asexually	1	1
11	(A) / Tt and Tt	1	1
12	(C) / (b) and (c)	1	1
13	(C) / Petals only	1	1
14	(D) / Dispersion, refraction and internal reflection	1	1
15	(B) / (a) and (c)	1	1
16	(A) / 2 trophic levels	1	1
17	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)	1	1
18	(C) / Assertion (A) is true, but Reason (R) is false	1	1
19	(D) / Assertion (A) is false but Reason (R) is true.	1	1
20	(B) / Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)	1	1
	SECTION B		
21	(a) $BaCl_{2\,(aq)} + Na_2SO_{4(aq)} \rightarrow 2NaCl\,(aq) + BaSO_4\,(s)$ (b) • Double displacement reaction • As exchange of ions takes place	1 ½ ½	2
22	• When he can not see nearby objects distinctly but can see far object clearly. • 2 causes: Focal length of the eye lens is too long. Eyeball becomes too small. • Convex or Converging lens	½ ½ ½ ½	2

23	(a)  Fig.12.6(a) on page 199-NCERT **Diagram:** **Directions of current and magnetic field:** **OR** (b) • Permanent magnet / Current carrying solenoid/ Electromagnet •  Fig-12.11, page no.201-NCERT **Diagram:** **Labelling:**	1 ½+½ ½ 1 ½	2
24	• Synthesized at shoot tip/root tip • When light falls on one side of the plant, auxin diffuses towards the shady side of shoot. The concentration of auxin stimulates the cells to grow longer on the side of shoot which is away from light. Thus, plant appears bent towards light/phototropism.	½ 1½	2
25	(a) 2 visible characters of garden pea plants are : • Tallness (dominant), Dwarfness (recessive) • Yellow seeds (dominant), Green seeds (recessive) **(Any other pair)**	 ½ + ½ ½ + ½	

	OR (b)  	½ ½ ½ ½	2
26	• Biodegradable – Substances that are broken down by biological processes. • Non-biodegradable –Substances that are not broken down by biological processes. **Classification:-** Biodegradable – Newspaper, Vegetable peels Non-biodegradable – Glass bottles, Polythene bags	½ ½ ½ ½	2
	SECTION C		
27	(a) (i) **Reduction Process-** Roasting **Reason-** Mercury has low reactivity. (ii) **Reduction Process-** Roasting **Reason-** Copper has low reactivity. (iii) **Reduction Process-** Electrolytic Reduction. **Reason-** Sodium has high reactivity . **OR** (b) (i) **Change in appearance -** White to black colour. **Reason-** Silver sulphide is formed.	½ ½ ½ ½ ½ ½ ½+½	

	(ii) **Change in appearance** – Reddish brown to green colour. **Reason-** Basic Copper Carbonate is formed. **(iii) Change in appearance**- Grey to brown colour. **Reason-** Rust (iron oxide) is formed.	½+½ ½ +½	3
28	Na = 2, 8, 1; O = 2,6  • Cation – Sodium Anion – Oxide	½+½ 1 ½ ½	3
29	(a) Constituents:- Brain and Spinal cord. Protection:- Brain – Bony box/in skull/Cranium/fluid filled balloon Spinal Cord – Vertebral column. (b) Limitations : (i) They will reach only those cells that are connected by nervous tissue, not each and every cell in the animal body. (ii) Once an electrical impulse is generated in a cell and transmitted, the cell will take some time to reset its mechanisms before it can generate and transmit a new impulse. **(Any other)**	½ + ½ ½ ½ ½ ½	3
30	• Difference : Common pathway for aerobic and anaerobic respiration Glucose → Pyruvate Glucose→Pyruvate $\xrightarrow{\text{Presence of } O_2}$ Carbon dioxide+Water + Energy Site – in mitochondria	½ +½ ½ 1 ½	3
31	• It prevents damage to the appliances and the electrical circuit from overloading and short circuiting. •	1	

Aerobic Respiration	Anaerobic Respiration
Utilises Oxygen	Takes place in the absence of Oxygen

	Here P = 3 kW = 3000 W, V = 220 V, I = ? P = V I $I = \frac{P}{V} = \frac{3000\ W}{220\ V} = 13{\cdot}63$ A 13·63 A > Rating of fuse 5 A, therefore fuse wire will melt and break the circuit.	½ 1 ½	3
32	• Scattering of light / Tyndall effect • When a beam of light strikes fine particles of smoke, it is reflected diffusely and the path of the light becomes visible. • Very fine particles scatter mainly blue light/short wavelength colours while the particles of larger size scatter longer wavelength colours.	1 1 1	3
33	• Each electrical appliance has its own switch due to which each one can be turned ON and OFF separately, as per their requirement. • If due to some defect one electrical appliance stops working, then all other appliances keep working. • Each appliance has equal potential difference and draws the required amount of current. • The total resistance in a parallel circuit is decreased. **(Any three)**	1 1 1	3
	SECTION E		
34	(a) (i) (1)  Fig.9.13(b)-Page-153, NCERT.	1	

(2)

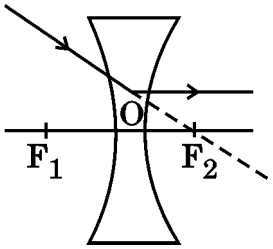


Fig.9.14(b)-Page-154, NCERT. 1

(Note:- Deduct half mark if directions of rays are not shown)

(ii) Given $u = -16$ cm, f = + 24 cm, h = 4 cm ½

Formula used $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ ½

$$\therefore \frac{1}{v} - \frac{1}{(-16)} = \frac{1}{+24}$$

$$\frac{1}{v} = \frac{-1}{48}$$

$v = -48$ cm 1

Image is formed on the same side as the object

$$m = \frac{h'}{h} = \frac{v}{u}$$ ½

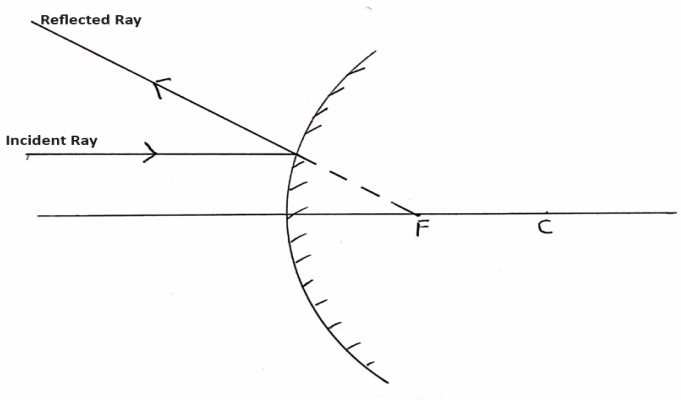
$$\frac{h'}{4} = \frac{-48}{-16}$$

h' = 12 cm ½

5

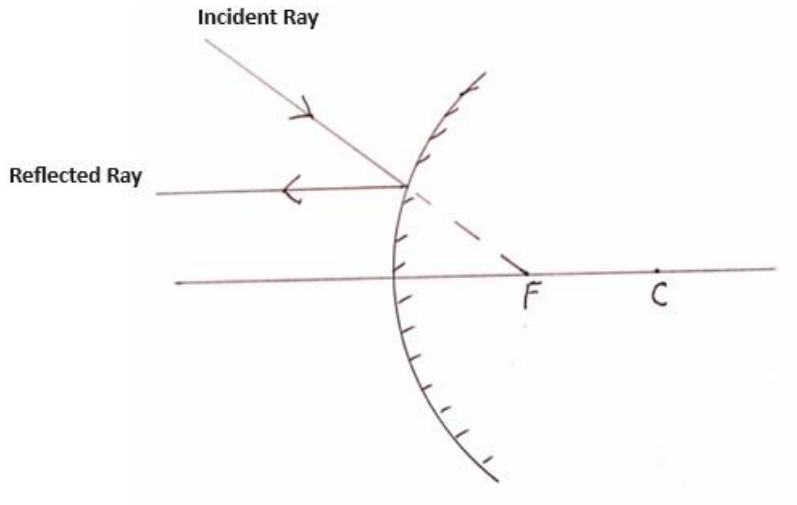
OR

(b) (i)
(1)



1

(2)



1

(Note:- Deduct half mark if directions of rays are not shown)

(ii) Here f = – 12 cm, u = – 18 cm, v = ?, h = 1·5 cm, h′ = ? ½

Mirror formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ ½

$$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$= \frac{1}{-12 \text{ cm}} - \frac{1}{-18 \text{ cm}}$$

$$= \frac{-1}{36}$$

$\therefore$ v = – 36 cm 1

$$m = \frac{h'}{h} = -\frac{v}{u}$$ ½

$$\frac{h'}{1.5} = -\frac{(-36)}{(-18)}$$

h' = – 3·0 cm ½

35	(a) • When the rate of general body growth begins to slow down and reproductive tissue begins to mature. • In boys – New thick hair growth on face, voice begins to crack, penis begins to enlarge and become erect. **(Any two)** (b) Testis – Formation of sperms, Secretion of hormone testosterone Role of : (i) Vas deferens – Delivery of sperms from testes to urethra. (ii) Seminal vesicle – Provides nutrition to sperms /makes the transport(movement) of sperms easier. (iii) Urethra – Common passage for sperms and urine. (iv) Scrotum – Providing required temperature for sperm formation **OR** (a) (i) Ovary – • Production of Estrogen hormone • Production of female gamete /egg (ii) Oviduct – • Transfer of female gamete from the ovary to uterus • Site of fertilisation (iii) Uterus – • Implantation of zygote • Nourishment of the developing embryo (b) Structure of Placenta – • Disc like structure embedded in the uterine wall connected to the embryo. • It has villi on the embryo's side and blood spaces on the mother's side.	1 ½+½ ½ ½ ½× 4 ½ ½ ½ ½ ½× 2	5

	Function : • Provides a large surface area for nutrients (glucose and oxygen) to pass from the mother's side to embryo, waste substances from embryo's side to mother's blood.	1	
36	(a) (i) (1) Solution B (2) Solution C (3) Solution A (4) Solution D (5) Solution E Increasing Order of H^+ ion concentration – C < E < D < A < B (ii)(1) Acidic salt : (Ammonium chloride) NH_4Cl **Parent Acid-**Hydrochloric acid /HCl **Parent Base**- Ammonium hydroxide/(NH_4OH) (2) Basic salt : **(**Sodium Carbonate) Na_2CO_3 **Parent Acid-**Carbonic acid / H_2CO_3 **Parent Base**- Sodium hydroxide / NaOH **(Or Any other)** **OR** (b) Chlor – alkali process; • When electricity is passed through NaCl (aq) it decomposes to form sodium hydroxide / $2NaCl + 2H_2O \rightarrow 2NaOH+Cl_2+H_2$ • X – Cl_2 gas – at anode • Y – H_2 gas – at cathode ***(award marks if explained by diagram)*** • Z – Bleaching powder / $CaOCl_2$ / Calcium Oxychloride • $Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$ (Bleaching powder)	½ x 5 ½ ½ ½ ½ ½ 1 ½ ½+ ½ ½ +½ ½ 1	5
	SECTION E		
37	(a) • CH_3Br • C_2H_5Br (b) (i) Aldehyde (ii) Ketone	½ ½ ½ ½	

	(c) • The colour of $KMnO_4$ disappears; • $KMnO_4$ acts as an oxidizing agent. • $CH_3CH_2OH \xrightarrow{Alkaline\ KMnO_4 + Heat} CH_3COOH$ **OR** (c) • Ethene Conc. H_2SO_4 acts as a dehydrating agent. • $C_2H_5OH \xrightarrow[443\ K]{Conc.\ H_2SO_4 + Heat} CH_2 = CH_2 + H_2O$	½ ½ 1 ½ ½ 1	4
38	(a) Salivary glands; Starch / Carbohydrate (b) Stomach, Anus (c) (i) The inner lining of the stomach will not be protected from the action of acid. (ii) Digested food will not be absorbed / Absorption area will be reduced. **OR** (c) • Emulsification of fats. • Acidic medium has to be made alkaline for the pancreatic enzymes to act.	½ + ½ ½ +½ 1 1 1 1	4
39	(a) (i) Bulb A glows (ii) Bulbs B, C, D and E glow (b) P = V×I 11 = 55 ×I I = $\frac{1}{5}$ = 0.2 amp (c) (i) Resistance of bulb B, R = $\frac{V}{I} = \frac{55\ V}{0.2\ A} = 275\ \Omega$ **(alternative formula for calculation R = $\frac{V^2}{P}$)**	½ ½ ½ ½ 1	

	(ii) Total resistance of the series combination of four bulbs $= 4 \times 275 = 1100\ \Omega$	1	
	OR		
	(c) • Bulb A will keep glowing with same brightness.	½	
	• Other bulbs i.e., B, D and E will stop glowing.	½	
	Reason: As the bulbs B, D and E are connected in series with fused bulb C, so no current flows through them and thus they will not glow. The bulb A remains unaffected as it is connected in parallel combination.	1	4

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