

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2025
SUBJECT NAME : SCIENCE (Q.P. CODE 31/1/2)

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 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	<ul style="list-style-type: none"> • 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.

SECONDARY SCHOOL EXAMINATION, 2025

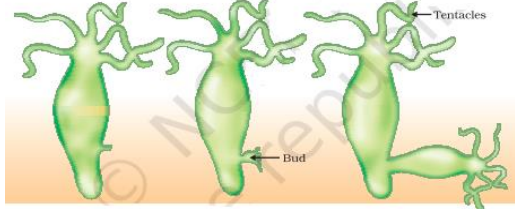
MARKING SCHEME

CLASS: X [SCIENCE (Subject Code–086)]

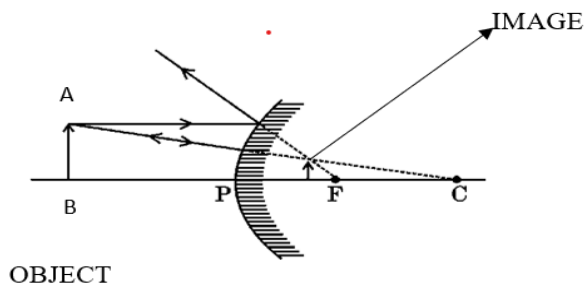
[Paper Code: 31/1/2]

Maximum Marks: 80

Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
SECTION A			
1.	A/ $Mg : \overset{\times\times}{\curvearrowright} \overset{\times\times}{\text{O}} : \times \rightarrow Mg^{2+} \left[\overset{\times\times}{\text{O}} : \overset{\times\times}{\text{O}} : 2- \right]$	1	1
2.	B / Calcium and Magnesium	1	1
3.	C/FeSO ₄	1	1
4.	C / It has weak electrostatic forces of attraction between its oppositely charged ions.	1	1
5.	D / 1 : 8	1	1
6.	A / Salt and water is formed	1	1
7.	B / Al ₂ O ₃ and MgO	1	1
8.	D / Auxins	1	1
9.	C / starch into simple sugars	1	1
10.	C / 100% round and yellow	1	1
11.	C / (i) and (iii)	1	1
12.	D / Cytoplasm and Oxygen deficient muscle cells	1	1
13.	D/Green light deviates more than the orange light	1	1
14.	A / (i) and (ii)	1	1
15.	D / 99%	1	1
16.	D / (ii) and (iv)	1	1
17.	C / Assertion (A) is true, but Reason (R) is false.	1	1
18.	B / Both Assertion (A) and Reason (R) are true, but Reason (R) is <i>not</i> the correct explanation of Assertion (A).	1	1
19.	B / Both Assertion (A) and Reason (R) are true, but Reason (R) is <i>not</i> the correct explanation of Assertion (A).	1	1
20.	A / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
SECTION B			
21.	Chemicals/pesticides used by farmers get washed down into the soil or water bodies and affect biotic and abiotic components of the ecosystem. These chemicals are mostly non-biodegradable and get accumulated progressively at each trophic level (Biological magnification). Thus, the health of the organisms of all trophic levels is affected.	2	2
22.	<ul style="list-style-type: none"> • (a) Power dissipated will be: • (I) minimum in circuit (ii) and • (II) maximum in circuit (iii) • • Justification : Power dissipated = $\frac{V^2}{R}$ • Since voltage is same in three cases, the power dissipation 	 ½ ½	

	<ul style="list-style-type: none"> • will be inversely proportional to the resistance of the circuit. • • (Award marks if explained through calculations) • • • OR • (b) Voltage $V = 220V$ • $P = V \times I$ • Power $P_1 = 100 W$ $P_2 = 60 W$ • $\therefore I_1 = \frac{P_1}{V} = \frac{100 W}{220 V} = 0.45 A$ • $\therefore I_2 = \frac{P_2}{V} = \frac{60 W}{220 V} = 0.27 A$ • \therefore Total current drawn • $I = I_1 + I_2 = 0.45 + 0.27 = 0.72 A$ 	<p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>	<p>2</p>
23.	<p>$f = -20 \text{ cm} ; u = -30 \text{ cm}$</p> $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{-20} - \frac{1}{-30}$ $\frac{1}{v} = \frac{1}{-20} + \frac{1}{30}$ <p>$v = -60 \text{ cm}$</p> <p>Position of image is 60 cm in front of the mirror.</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p>	<p>2</p>
24.	<p>(a)</p> <ul style="list-style-type: none"> • Plugging of the leak in blood vessels prevents lowering of the blood pressure / maintains the efficiency of the pumping system • Platelets • Help to clot the blood at the site of injury. <p>OR</p> <p>(b)</p> <p>(i) Plants have low energy needs because have a large proportion of dead cells in many tissues / Plants have low energy needs as they do not move</p> <p>(ii) Translocation of soluble products of photosynthesis from leaves to other parts of the plant / It transports amino acids and other substances to storage organs of roots, fruits and seeds and to growing organs.</p>	<p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p> <p>1</p>	<p>2</p>
25.	 <p style="text-align: right;">diagram</p>	<p>1</p>	

(ii)



1 ½

(Note: Deduct ½ mark if arrows are not drawn.)

3

30.

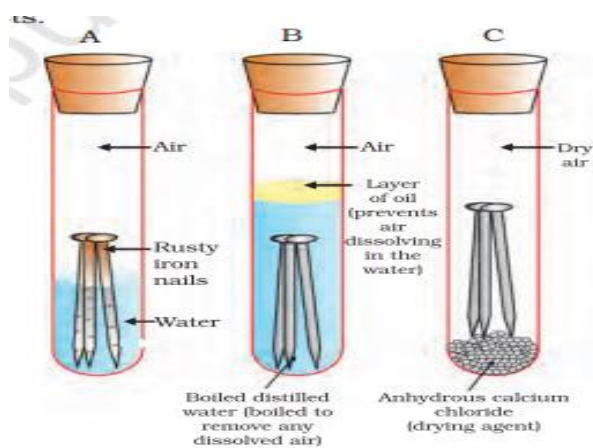
(a)

- Take three test tubes and place clean iron nails in each of them.
- Label these test tubes A, B and C.
- Pour some water in test tube A and cork it.
- Pour boiled distilled water in test tube B, add about 1 mL of oil and cork it. The oil will float on water and prevent the air from dissolving in the water.
- Put some anhydrous calcium chloride in test tube C and cork it. Anhydrous calcium chloride will absorb the moisture, if any, from the air.

Iron nails rust in test tube A, but they do not rust in test tubes B and C.

Rusting of iron takes place when exposed to both air and water.

/



3


Iron nails rust in test tube A, but they do not rust in test tubes B and C.

Rusting of iron takes place when exposed to both air and water.

(Note: if a student explains activity through description or through labelled diagram, give full marks.)

OR

(b) (i)

	<ul style="list-style-type: none"> Sodium, Potassium, Lithium (any two) Observations: <ul style="list-style-type: none"> A violent reaction occurs. Large amount of heat is evolved. Evolved gas catches fire. 	1/2, 1/2	
	(ii) The gas (bubbles) burns with a pop sound	1/2	3
31.	<p>(a)</p> $3 \text{MnO}_2(s) + 4 \text{Al}(s) \longrightarrow 3 \text{Mn}(l) + 2 \text{Al}_2\text{O}_3(s) + \text{heat}$ $\text{Fe}_2\text{O}_3(s) + 2 \text{Al}(s) \longrightarrow 2 \text{Fe}(l) + \text{Al}_2\text{O}_3(s) + \text{heat}$ <p>(Award marks if explained through statement or any other reaction)</p> <p>(b) Metals towards the top of the reactivity series (Na, Mg, Ca) have more affinity for oxygen than carbon.</p>	1 1 1	3
32.	<ul style="list-style-type: none"> Calculation of ratio of Seeds as per data given. Round and yellow – $\frac{800}{90} = 9$, Round and green – $\frac{275}{90} = 3$ Wrinkled and yellow – $\frac{268}{90} = 3$ Wrinkled and green – $\frac{90}{90} = 1$ Parents – Round and Yellow × Wrinkled and Green RRYY × rryy Gametes  <p>F₁ – <u>Rr</u><u>Yy</u></p> <p>Gamete – RY/Ry/rY/ry</p> <p>F₂ – <u>9</u> : 3 : 3 : 1</p> <p>Round yellow – 9 </p> <p>Round green – 3</p> <p>Wrinkled yellow – 3</p> <p>Wrinkled green – 1</p> <p>(Award marks if explained through Mendel's cross using two separate characters)</p> <ul style="list-style-type: none"> Appearance of new combinations of characteristics show that traits for Round/Wrinkled and Yellow/Green seeds are independently inherited/ Independent inheritance of two separate traits. 	1 1 1	3

$$\frac{\sin i}{\sin r} = \text{constant}$$

Convex Lens	Concave Lens
(I) Object to be placed between O and F	Object can be placed anywhere in front of the lens
(II) Magnified image	Diminished/smaller image

1

1

5

35.

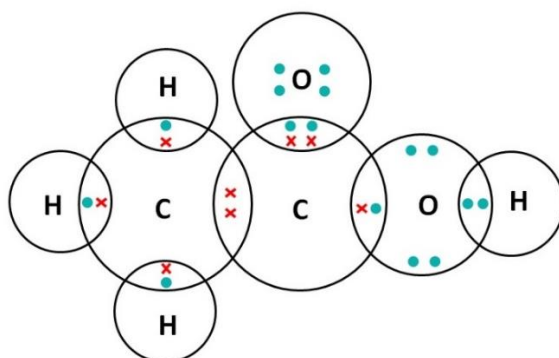
- (a) (i) A = Ethanol /Ethyl alcohol / C_2H_5OH
 B = Ethanoic acid /Acetic acid / CH_3COOH
 C = Ethene / $C_2H_4/CH_2=CH_2$
- (ii) Molecular mass of ethene (C_2H_4)
 $12 \times 2 + 1 \times 4 = 24 + 4 = 28 \text{ u}$
- (iii) Brisk effervescence is observed.
 $CH_3COOH + Na_2CO_3 \rightarrow CH_3COONa + H_2O + CO_2$
- (iv) (Ethanoic acid)

 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

1

 $\frac{1}{2}$

1



1

OR

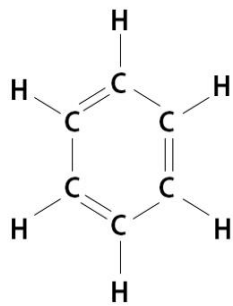
- (b) (i)
 - Homologous series: A series of organic compounds in which the same functional groups or hetero-atom substitutes for hydrogen in a carbon chain/A sequence of a carbon compound with same general formula and similar chemical properties.
 - $HCOOH, CH_3COOH, C_2H_5COOH$
 - Methanoic acid, Ethanoic acid, Propanoic acid
 (any other 3 successive members)
- (ii)
 - (I) Benzene
 - (II) Cyclohexane

1

1

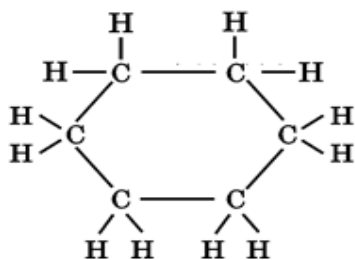
1

 $\frac{1}{2}$ $\frac{1}{2}$



Benzene

OR



Cyclohexane

(any other example)

1

5

36.

- a) (i)
 (I) Ovary: Produces female gamete (egg) and female hormones(oestrogen).
 (II) Fallopian tube: Site of Fertilization
 (III) Uterus: Site of Implantation and embryonic development.
- (ii) Methods of contraception used by males:
- Mechanical barrier - Condoms
 - Surgical method – blocking the vas deferens in males (Vasectomy)

½,½

1

1

1

1

OR

(b) (i)

Self-pollination	Cross-pollination
Pollen grains are transferred from stamen to the stigma of the same flower.	Transfer of pollen grains from stamen of one flower to the stigma of another flower of same species.

2

(ii)

- A – Stigma: Receives pollen and provides suitable environment for its germination.
 B –Pollen tube: Carries males germ cells (gametes) to the female gamete situated in the ovary.
 C – Egg Cell: (Female germ cell): Fuses with male gamete and forms zygote.

½,½

½,½

½,½

5

SECTION E

37.

- (a) Live wire- Red
 Neutral wire- Black

½

½

	<p>(b) Power, $P = 1 \text{ kW} = 1 \times 1000 \text{ W} = 1000 \text{ W}$ Voltage, $V = 220 \text{ V}$ Current drawn $I = ?$ $P = V \times I$ $I = \frac{1000 \text{ W}}{220 \text{ V}} = 4.54 \text{ A}$ Current rating should be of 5A.</p> <p>(c) (i)</p> <ul style="list-style-type: none"> The earth wire provides a low resistance conducting path for the current which ensures that any leakage of current to flow to the metallic body of the appliances, keeps its potential to that of the earth. The user will not get an electric shock. <p style="text-align: center;">OR</p> <p>(c) (ii)</p> <ul style="list-style-type: none"> Fuse wire Earth wire A fuse in a circuit prevents damage to the circuit due to overloading. Earth wire prevents electric shock due to leakage of current. 	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p> <p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>	4
38.	<p>(a) Photosynthesis A process by which green plants capture sunlight and convert it to chemical energy with the help of chlorophyll / Process by which carbon dioxide and water is converted into carbohydrates in the presence of sunlight chlorophyll and water.</p> <p>(b)</p> $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ <p>(c) (i)</p> <ul style="list-style-type: none"> Absorption of light energy by chlorophyll Conversion of light energy to chemical energy. Reduction of carbon dioxide to carbohydrates. Desert plants take up CO_2 at night and prepare an intermediate, which is acted upon by the energy absorbed by the chlorophyll during the day. <p style="text-align: center;">OR</p> <p>(c) (ii) (I) Decrease the rate of photosynthesis due to low amount of sunlight. (II) Decreases the rate of photosynthesis due to reduced gaseous exchange</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p>	4
39.	<p>(a) $2 \text{NaCl} + 2 \text{H}_2\text{O} \xrightarrow{\text{electricity}} 2 \text{NaOH} + \text{H}_2 + \text{Cl}_2$</p> <p>(b) Uses of NaOH : Degreasing metals/ Soaps and Detergents/ paper making/ artificial fibres/ preparation of bleach</p>	<p>1</p> <p>$\frac{1}{2}, \frac{1}{2}$</p>	

	<p>Uses of H₂: As fuel/ Margarine/ Preparation of ammonia for fertilizers/preparation of HCl</p> <p>Uses of Cl₂ : Disinfectant/ PVC/ water treatment/ in swimming pools/ CFC's/ preparation of bleach/ preparation of HCl/ pesticides (Any two uses of anyone product)</p> <p>(c) (i) A – NaHCO₃/ Sodium Hydrogen Carbonate/Baking soda</p> <p style="padding-left: 40px;">B – Na₂CO₃ / Sodium Carbonate</p> $2 \underset{\text{A}}{\text{NaHCO}_3} \xrightarrow{\text{heat}} \underset{\text{B}}{\text{Na}_2\text{CO}_3} + \text{H}_2\text{O} + \text{CO}_2$ <p style="text-align: center;">OR</p> <p>(c) (ii) • The fixed number of water molecules present in one formula unit of a salt.</p> <ul style="list-style-type: none"> • CuSO₄.5H₂O/ Copper Sulphate pentahydrate/Blue vitriol • CaSO₄.2H₂O/Gypsum/Calcium sulphate dihydrate • Na₂CO₃.10H₂O/Washing Soda/Sodium carbonate decahydrate • FeSO₄.7 H₂O / Green Vitriol/Ferrous sulphate heptahydrate • CaSO₄. ½ H₂O /Calcium Sulphate hemihydrate/POP <p style="text-align: center;">(Any two examples)</p>	<p>½</p> <p>½</p> <p>1</p> <p>1</p> <p>½,½</p>	<p>4</p>
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