

**Marking Scheme**  
**Strictly Confidential**  
**(For Internal and Restricted use only)**  
**Secondary School Examination, 2026 (X<sup>th</sup>)**  
**SUBJECT NAME SCIENCE (Q.P. CODE /Set No 31/3/1)**

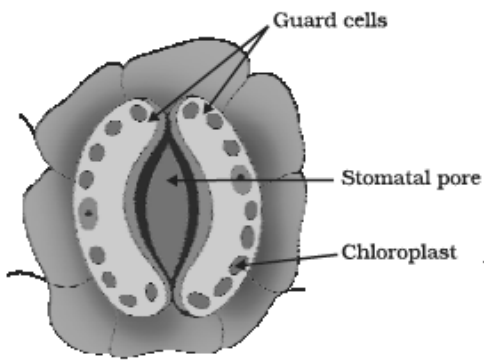
**General Instructions: -**

<b>1</b>	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.
<b>2</b>	<b>“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.”</b>
<b>3</b>	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. <b>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.</b>
<b>4</b>	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.
<b>5</b>	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.
<b>6</b>	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. <b>This is most common mistake which evaluators are committing.</b>
<b>7</b>	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.
<b>8</b>	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 <b>“Extra Question”</b> .
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	<p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"> <li>● Leaving answer or part thereof unassessed in an answer book.</li> <li>● Giving more marks for an answer than assigned to it.</li> <li>● Wrong totalling of marks awarded on an answer.</li> <li>● Wrong transfer of marks from the inside pages of the answer book to the title page.</li> <li>● Wrong question wise totalling on the title page.</li> <li>● Wrong totalling of marks of the two columns on the title page.</li> <li>● Wrong grand total.</li> <li>● Marks in words and figures not tallying/not same.</li> <li>● Wrong transfer of marks from the answer book to online award list.</li> <li>● 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.)</li> </ul> <p>Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</p>
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 totalling 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 <b>“Guidelines for Spot Evaluation”</b> 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 totalled 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**  
**SCIENCE (Subject Code-086)**  
**(PAPER CODE: 31/3/1) (10-03-86K)**

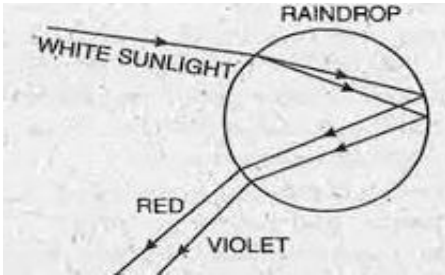
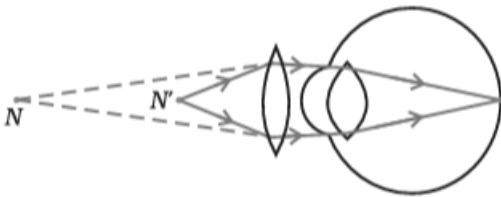
S.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total marks
	<b>SECTION – A</b> <b>(Biology)</b>		
1.	(B)/ (i) and (iii)	1	1
2.	(B)/ Both plants are covered with separate wooden bell-jars	1	1
3.	(C)/ Hind Brain-Cerebellum	1	1
4.	(D)/ Axonal end of one neuron to dendritic end of another neuron	1	1
5.	(A)/ Food Web	1	1
6.	(B)/ Human Beings	1	1
7.	(D)/ Rapid cell division in tendril cells that are away from the support	1	1
8.	(A)/ Both A and R are true, and R is the correct explanation of A	1	1
9.	(B)/ Both A and R are true but R is not the correct explanation of A	1	1
10	(i) To freeze the CFC production at 1986 levels. (ii) Ozone shields the earth's surface from harmful UV radiations.	1 1	2
11	<ul style="list-style-type: none"> <li>Aerobic Respiration</li> <li>Complete breakdown of glucose takes place in presence of oxygen releasing more energy.</li> </ul>	1 1	2
12	I. (i) 2-chambered (ii) Amphibians/Reptiles (iii) Double circulation  II. Double circulation	$\frac{1}{2} \times 3$  $\frac{1}{2}$	2
13.	<ul style="list-style-type: none"> <li>Root pressure: Cells in the contact of the soil actively take up ions and creates a difference in concentration between roots and soil, water moves from soil to root to eliminate this difference.</li> <li>Transpirational pull: Water lost through transpiration from aerial parts of plants, creates a suction which pulls water column from xylem cells of roots.</li> </ul>	$\frac{1}{2} + 1$  $\frac{1}{2} + 1$	3
14.	Parents: TT                      x                      tt (Tall)                                      (short)	$\frac{1}{2}$	

	<p>Gametes: <math>\text{T}</math>, <math>\text{T}</math> <math>\text{t}</math>, <math>\text{t}</math></p> <p><math>\text{F}_1</math> <math>\text{Tt}</math> All Tall plants</p> <p>Observations:</p> <ul style="list-style-type: none"> <li>No medium or short height plants were observed in <math>\text{F}_1</math> generation.</li> <li>All progeny resembles one of the parents.</li> <li>All plants were tall.</li> </ul> <p>(any two observations)</p>	$\frac{1}{2}$  1  $\frac{1}{2}$  $\frac{1}{2}$	3
15.	<p>(a) (i) Opening of stomata during the day is minimised to prevent loss of water by evaporation. / Transpiration (loss of water in the form of water vapour) is minimised.</p> <p>(ii) Stomata</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>Absorption of light energy by Chlorophyll.</li> <li>Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen</li> <li>Reduction of Carbon Dioxide into Carbohydrates</li> </ul> <p>(ii) At night.</p> <p>(iii) Diagram of Open stomatal pore.</p> <div style="text-align: center;">  <p>Diagram - 1 Mark Labelling - 1 Mark</p> </div>	2  2    1  1   2	4
16	<p>(a) (i)</p> <ul style="list-style-type: none"> <li>Structure: <i>Bryophyllum</i> leaf</li> <li>Type: Vegetative propagation / Asexual reproduction</li> </ul> <p>(ii)</p> <ul style="list-style-type: none"> <li><u>Advantage</u>: Genetically identical plants, maintaining desirable traits of the parents. / Bear flowers and fruits</li> </ul>	$\frac{1}{2}$ $\frac{1}{2}$  1	

	<p>earlier than those plants which are grown from seeds / Used for the plants that have lost their capacity to produce seeds. (any one)</p> <ul style="list-style-type: none"> <li>Disadvantage: No genetic variation.</li> </ul> <p>(iii) As DNA of single parent is involved without gamete fusion. / Offsprings are produced by mitosis hence similar genetic makeup thus, no variation.</p> <p>(iv) It creates genetic variation, enhances chances of survival in changing environment and drives evolution.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) Name: Multiple Fission Type: Asexual reproduction</p> <p>(ii) In stage P, many daughter cells are produced by multiple fission / Repeated nuclear divisions followed by cytoplasmic divisions.</p> <p>(iii) <i>Plasmodium</i> (any other)</p> <p>(iv)</p> <ul style="list-style-type: none"> <li>Vegetative propagation</li> </ul> <p><u>Advantages</u> –</p> <ul style="list-style-type: none"> <li>All the plants produced are genetically similar to the parent plant</li> <li>Such plants can bear flowers and fruits earlier than those produced from seeds.</li> </ul> <p style="text-align: right;">( any other advantage)</p>	<p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p> <p>1</p>	<p>5</p>
<b>SECTION – B</b> <b>(Chemistry)</b>			
17.	(B)/ The reaction of a reactive metal with dilute acid.	1	1
18.	(C)/ Copper (II) chloride, which is blue-green in colour.	1	1
19.	(A)/ 2,2	1	1
20.	(D)/ (iii) and (iv)	1	1
21.	(C)/ Exothermic, but the heat evolved is not sufficient for the hydrogen to catch fire.	1	1
22.	(D)/ Case (iii) only	1	1
23.	(C)/ $\text{Na}_2\text{ZnO}_2$	1	1
24.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
25.	<p>(i)</p> $  \begin{array}{c}  \text{Na} \cdot \quad \cdot \text{O} \cdot \\  \text{Na} \cdot \quad \cdot \text{O} \cdot  \end{array}  \longrightarrow  \left[ \text{Na}^+ \right]_2 \quad \left[ \text{:} \ddot{\text{O}}^{2-} \right]  $ <p>(ii)</p>	1	

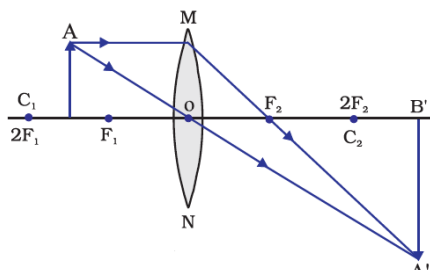
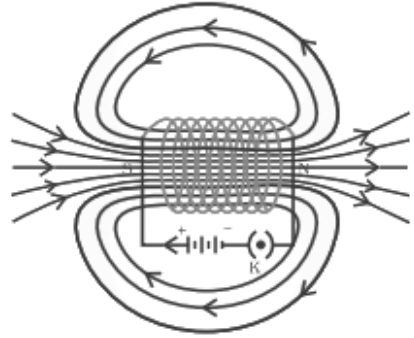
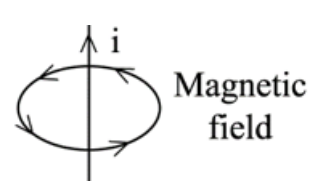
		1	2
26.	<ul style="list-style-type: none"> <li>Thermal decomposition reaction</li> <li> <math display="block">2\text{FeSO}_4(\text{s}) \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3(\text{s}) + \text{SO}_2(\text{g}) + \text{SO}_3(\text{g})</math>           (deduct ½ mark if no / incorrect balancing)         </li> <li>Endothermic reaction</li> </ul>	1 1 1	3
27.	<p>(a) (i) When acid is added to water, it does not cause excessive local heating/ does not splash out and cause burns.</p> <p>(ii) Because dry HCl does not ionize/produce H<sup>+</sup> ions whereas in dilute HCl, H<sup>+</sup> ions are present.</p> <p>(iii) Because of loss of 5 molecules of water of crystallisation.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) <math>2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{l}) \xrightarrow{\text{electricity}} 2\text{NaOH}(\text{aq}) + \text{H}_2(\text{g}) + \text{Cl}_2(\text{g})</math></p> <p>(ii) <math>\text{NaCl} + \text{H}_2\text{O} + \text{NH}_3 + \text{CO}_2 \longrightarrow \text{NaHCO}_3 + \text{NH}_4\text{Cl}</math></p> <p>(iii) <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \xrightarrow{373\text{K}} \text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + 1\frac{1}{2}\text{H}_2\text{O}</math></p> <p>(Deduct ½ mark if no/ incorrect balancing in each case)</p>	1 1 1 1 1 1	3
28.	<p>(a) During electrolytic refining of a metal, the insoluble impurities which settle down at the bottom of the anode is called anode mud.</p> <p>(b) Anode: Impure copper rod Cathode: Pure copper strip</p> <p>(c) (i) <math>2\text{Cu}_2\text{S} + 3\text{O}_2(\text{g}) \xrightarrow{\text{heat}} 2\text{Cu}_2\text{O}(\text{s}) + 2\text{SO}_2(\text{g})</math></p> <p><math>2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \xrightarrow{\text{heat}} 6\text{Cu}(\text{s}) + \text{SO}_2(\text{g})</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(c) (ii)</p> <p>(Diagram- 1 mark, Labelling-1 mark)</p>	1 ½ ½ 1 1 2	4

29.	<p>(a) (i)</p> <ul style="list-style-type: none"> <li>A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain. / Can be represented by a single general formula and successive members differ by <math>-\text{CH}_2</math> unit or 14u.</li> <li><math>\text{C}_2\text{H}_4</math> and <math>\text{C}_4\text{H}_8</math> belong to the same homologous series/ are alkenes.</li> </ul> <p>(ii) (I) <math>\text{CH}_3\text{CH}_2\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}</math>  (II) <math>\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \xrightarrow{\text{Burning}} 2\text{CO}_2 + 3\text{H}_2\text{O}</math>  (balancing may be ignored)</p> <p>(iii) The ionic end of soap interacts with water while the carbon chain interacts with oil/dirt. The soap molecules thus form a structure called micelle.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) (I) Propanone/acetone  (II) Propyne</p> <p>(ii) Hydrogenation/addition reaction.</p> <p>(iii) <math>\text{C}_4\text{H}_{10}</math> will have higher melting point, as it has a higher molecular mass than <math>\text{C}_3\text{H}_8</math> and melting point increases with the increase in molecular mass.</p> <p>(iv) Sodium ethoxide (<math>\text{C}_2\text{H}_5\text{ONa}</math>) is formed and hydrogen gas is evolved.</p> <p style="text-align: center;">/</p> <p><math>2\text{Na} + 2\text{CH}_3\text{CH}_2\text{OH} \rightarrow 2\text{CH}_3\text{CH}_2\text{O}^-\text{Na}^+ + \text{H}_2</math>  (balancing may be ignored)</p> <p>(v) <math>\text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH} \rightarrow \text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH}</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>	<p>5</p>
	<b>SECTION – C</b> <b>(Physics)</b>		
30.	(C) /Ammeter in series and voltmeter in parallel.	1	1
31.	(C) /Colour of ray 1- Red; Colour of ray 2 - Violet	1	1
32.	(D)/Assertion (A) is false, but Reason (R) is true.	1	1
33.	<p>(a) Medium A is optically denser than B because light ray is going away from the normal NN'.</p> <p>(b) <math>n_{BA} = \frac{v_A}{v_B}</math></p>	<p>1</p> <p>1</p>	2
34.	<p>(a) (i) Mainly blue coloured light is scattered because very fine particles scatter shorter wavelength.</p> <p>(ii) Scattered light may appear white because very large size particles scatter light of all wavelengths.</p>	<p>1</p> <p>1</p>	

	<p style="text-align: center;"><b>OR</b></p> <p>(b)</p>  <p>A natural spectrum like rainbow is formed when sunlight passes through tiny water droplets present in the atmosphere. The water droplets disperse the incident light ray, then reflect it internally and finally refract it again when it comes out of the raindrop. (any other phenomenon of spectrum in nature)</p>	1	
	<p>1</p> <p>2</p>		
35.	<p>(a)</p> <ul style="list-style-type: none"> <li>• Hypermetropia/ Far -Sightedness</li> <li>• Behind the retina.</li> </ul> <p>(b)</p> <ul style="list-style-type: none"> <li>• Focal length of the eye lens is too long.</li> <li>• The eye ball has become too small.</li> </ul> <p>(c)</p> 	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p>	3
36.	<p>(a) (i) Battery / Electric cell</p> <p>(ii) Rheostat / Variable resistance</p> <p>(b) Resistance of the heater, <math>R = \frac{V}{I}</math></p> $R = \frac{110}{5}$ $R = 22 \Omega$ <p>Current through the heater, <math>I' = \frac{V'}{R}</math></p> $= \frac{220}{22}$ $= 10 \text{ A}$ <p style="text-align: center;">/</p> <p><b>Alternate answer for (b):</b></p> <ul style="list-style-type: none"> <li>• According to Ohm's law, potential difference is directly proportional to current.</li> <li>• When the potential difference is doubled, current will also be doubled. So, value of current will be 10A.</li> </ul>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p>1</p> <p>1</p>	3
37.	<p>(a) <math>4 \Omega</math> and <math>1 \Omega</math> are in series, <math>R_s = 4\Omega + 1 \Omega = 5 \Omega</math></p>		



	<p>Resistance across R and S, <math>\frac{1}{R_1} = \frac{1}{5} + \frac{1}{5}</math></p> $R_1 = \frac{5}{2} \Omega$ <p>2 <math>\Omega</math> and 3 <math>\Omega</math> are in series, <math>R_{s1} = 2\Omega + 3 \Omega = 5 \Omega</math></p> <p>Resistance across P and Q, <math>\frac{1}{R_2} = \frac{1}{5} + \frac{1}{5}</math></p> $R_2 = \frac{5}{2} \Omega$ <p>Total resistance: <math>R = R_1 + R_2</math></p> $= \frac{5}{2} + \frac{5}{2}$ $= 5 \Omega$ <p>(b) <math>I = \frac{V}{R}</math></p> $I = \frac{10}{5}$ $I = 2 \text{ A}$ <p>(c) <math>V = I R</math></p> $V = 2 \times \frac{5}{2}$ $V = 5 \text{ V}$	1	
38.	<p>(a) In observation no.3. The object distance is equal to image distance, which is only possible when the object is at 2F (C) =50 cm. Therefore, the focal length is 25 cm.</p> <p>(b)</p> <ul style="list-style-type: none"> <li>• Observation no. 6</li> <li>• Because when object is kept between F and O, image formed by lens will be on same side of object. Hence, image distance(v) should be negative.</li> </ul> <p>(c) (i) <math>m = \frac{v}{u}</math></p> $= \frac{150}{-30}$ $m = -5$ <ul style="list-style-type: none"> <li>• Nature of image: Image will be real and inverted</li> <li>• Reason: because the value of m is negative.</li> </ul>	<p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	3

	<p style="text-align: center;"><b>OR</b></p> <p>(c) (ii)</p>  <p style="text-align: center;">(deduct ½ mark for no or incorrect direction of rays)</p>	2	4
39.	<p>(a)</p> <p>(i) Solenoid – A coil of many circular turns of insulated copper wire, wrapped closely in the shape of cylinder.</p>  <p>(ii)</p> <ul style="list-style-type: none"> <li>• Current flowing through the solenoid</li> <li>• No. of turns of the coil</li> </ul> <p>(iii)</p>  <p style="text-align: center;">Magnetic field</p> <p>Note: Award marks if a different direction of current is shown with the correct corresponding direction of magnetic field.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) When current is passed through the conductor, it experiences a force and gets displaced.</p>	1	2
		½	½
		1	

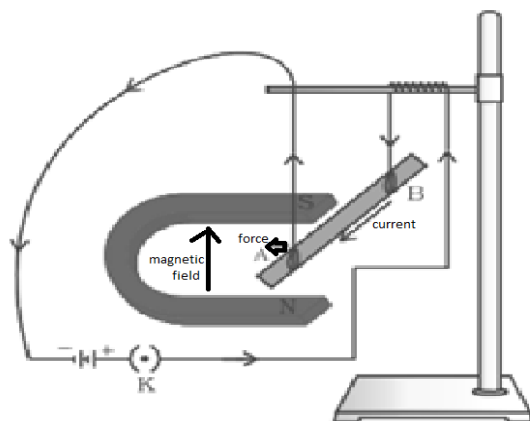


diagram  $1\frac{1}{2}$   
 direction of current  $\frac{1}{2}$   
 direction of magnetic field  $\frac{1}{2}$   
 direction of force  $\frac{1}{2}$

- (ii) (I) Into the plane of paper  
 (II) The direction of force will remain same.

1  
 1  
 5

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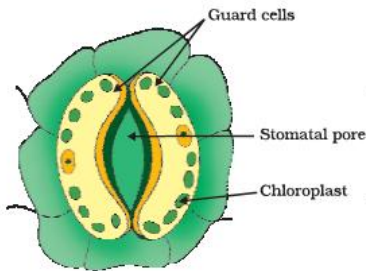
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9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “ <b>Extra Question</b> ”.
10	No marks to be deducted for the cumulative effect of an error. 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	<p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"> <li>• Leaving answer or part thereof unassessed in an answer book.</li> <li>• Giving more marks for an answer than assigned to it.</li> <li>• Wrong totalling of marks awarded on an answer.</li> <li>• Wrong transfer of marks from the inside pages of the answer book to the title page.</li> <li>• Wrong question wise totalling on the title page.</li> <li>• Wrong totalling of marks of the two columns on the title page.</li> <li>• Wrong grand total.</li> <li>• Marks in words and figures not tallying/not same.</li> <li>• Wrong transfer of marks from the answer book to online award list.</li> <li>• 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.)</li> </ul> <p>Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</p>
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 totalling 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 “ <b>Guidelines for Spot Evaluation</b> ” 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 totalled 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**  
**SCIENCE (Subject Code-086)**  
**(PAPER CODE: 31/3/2) (10-03-86K)**

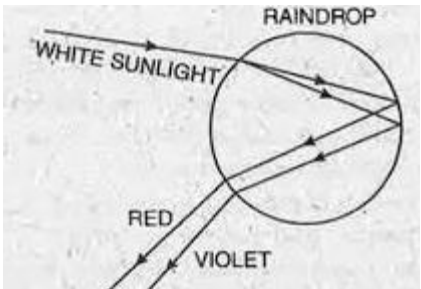
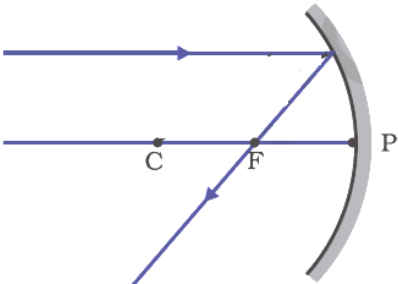
Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
	<b>SECTION – A</b> <b>(Biology)</b>		
1.	(B)/ Both plants are covered with separate wooden bell-jars	1	1
2.	(A)/ Food Web	1	1
3.	(D)/ Axonal end of one neuron to dendritic end of another neuron	1	1
4.	(D)/ Rapid cell division in tendril cells that are away from the support	1	1
5.	(B)/ Human Beings	1	1
6.	(A) Promote cell division	1	1
7.	(D) halving of chromosomes at the time of gamete formation.	1	1
8.	(B)/ Both A and R are true but R is not the correct explanation of A	1	1
9.	(B)Both A and R are true but R is not the correct explanation of A.	1	1
10.	<ul style="list-style-type: none"><li>• Aerobic Respiration</li><li>• Complete breakdown of glucose takes place in presence of oxygen releasing more energy.</li></ul>	1 1	2
11.	I. (i) 2-chambered (ii) Amphibians/Reptiles (iii) Double circulation II. Double circulation	$\frac{1}{2} \times 3$  $\frac{1}{2}$	2
12.	Plant → Goat → Man  According to 10 % Law, only 10 % of energy from a trophic level is transferred to the next trophic level. So, if Man has 5 J energy then Goat has $5 \times 10 = 50$ J And plants (producers) have $50 \times 10 = 500$ Joule	1      1	2
13.	(a) All Blue flowers (b)  Parents : BB × bb  Gametes (B) (b) F <sub>1</sub> Bb (Blue)  Self      Bb × Bb Pollination Gametes (B) (b), (B), (b)    B   b     B   BB   Bb     b   Bb   bb	1   	

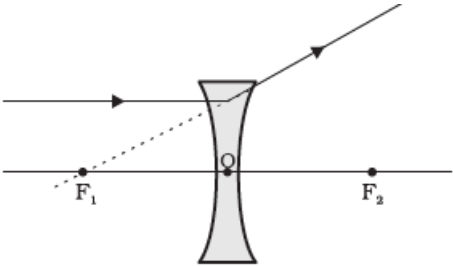
	<p>/</p> <p>25% flowers are white (Blue: White= 3:1, <math>\frac{1}{4} \times 100 = 25</math>)</p> <p>(c) BB: bb :: 1: 1</p>	1	3
14.	<ul style="list-style-type: none"> <li>Root pressure: Cells in the contact of the soil actively take up ions and creates a difference in concentration between roots and soil, water moves from soil to root to eliminate this difference.</li> <li>Transpirational pull: Water lost through transpiration from aerial parts of plants, creates a suction which pulls water column from xylem cells of roots.</li> </ul>	$\frac{1}{2}+1$ $\frac{1}{2}+1$	3
15.	<p>(a) (i) Opening of stomata during the day is minimised to prevent loss of water by evaporation. / Transpiration (loss of water in the form of water vapour) is minimised.</p> <p>(ii) Stomata</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>Absorption of light energy by Chlorophyll.</li> <li>Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.</li> <li>Reduction of carbon dioxide into carbohydrates.</li> </ul> <p>(ii) At night.</p> <p>(iii) Diagram of Open stomatal pore.</p> <div style="text-align: center;">  <p>Diagram - 1 mark Labelling - 1 Mark</p> </div>	2 2  1  1  2	4
16.	<p>(a) (i) Name: Multiple Fission Type: Asexual reproduction</p> <p>(ii) In stage P, many daughter cells are produced by multiple fission / Repeated nuclear divisions followed by cytoplasmic divisions.</p> <p>(iii) <i>Plasmodium</i> (any other)</p> <p>(iv) Vegetative propagation</p> <p><u>Advantages</u> –</p> <ul style="list-style-type: none"> <li>All the plants produced are genetically similar to the parent plant</li> </ul>	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1	

	<ul style="list-style-type: none"> <li>Such plants can bear flowers and fruits earlier than those produced from seeds.</li> </ul> <p style="text-align: right;">( any other advantage)</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) Structure: <i>Bryophyllum</i> leaf Type: Asexual reproduction/ vegetative propagation</p> <p>(ii)</p> <ul style="list-style-type: none"> <li><u>Advantage</u>: Genetically identical plants, maintaining desirable traits of the parents. / Bear flowers and fruits earlier than those plants which are grown from seeds / Used for the plants that have lost their capacity to produce seeds. (Any one)</li> <li><u>Disadvantage</u>: No genetic variation</li> </ul> <p>(iii) As DNA of single parent is involved without gamete fusion. / Offsprings are produced by mitosis hence similar genetic makeup thus no variation.</p> <p>(iv) It creates genetic variation, enhances chances of survival in changing environment and drives evolution.</p>	<p><b>1</b></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	<b>5</b>
<b>SECTION – B</b> <b>(Chemistry)</b>			
<b>17.</b>	(C)/ $\text{Na}_2\text{ZnO}_2$	<b>1</b>	<b>1</b>
<b>18.</b>	(D)/ Case (iii) only	<b>1</b>	<b>1</b>
<b>19.</b>	(C)/ Exothermic, but the heat evolved is not sufficient for the hydrogen to catch fire.	<b>1</b>	<b>1</b>
<b>20.</b>	(B)/ $\text{C}_4\text{H}_8$	<b>1</b>	<b>1</b>
<b>21.</b>	(A)/ 2,2	<b>1</b>	<b>1</b>
<b>22.</b>	(C)/ Copper (II) chloride, which is blue-green in colour.	<b>1</b>	<b>1</b>
<b>23.</b>	(B)/ The reaction of a reactive metal with dilute acid.	<b>1</b>	<b>1</b>
<b>24.</b>	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	<b>1</b>	<b>1</b>
<b>25.</b>	<p>(i) Hard and brittle solid because of strong force of attraction between positive and negative ions.</p> <p>(ii) High melting and boiling point because a considerable amount of energy is required to break the strong inter-ionic attraction.</p>	<p><b>1</b></p> <p><b>1</b></p>	<b>2</b>
<b>26.</b>	<p>(i) To prevent the chips from getting oxidised/rancid.</p> <p>(ii) During respiration, glucose combines with oxygen in the cells of our body and gives energy.</p> <p>(iii) To prevent the decomposition of silver chloride into silver and chlorine by sunlight.</p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	<b>3</b>
<b>27.</b>	<p>(a) (i) When acid is added to water, it does not cause excessive local heating/ does not splash out and cause burns.</p> <p>(ii) Because dry HCl does not ionize/produce <math>\text{H}^+</math> ions whereas in dilute HCl, <math>\text{H}^+</math> ions are present.</p> <p>(iii) Because of loss of 5 molecules of water of crystallisation.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) <math>2\text{NaCl(aq)} + 2\text{H}_2\text{O(l)} \longrightarrow 2\text{NaOH(aq)} + \text{H}_2\text{(g)} + \text{Cl}_2\text{(g)}</math></p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p>	

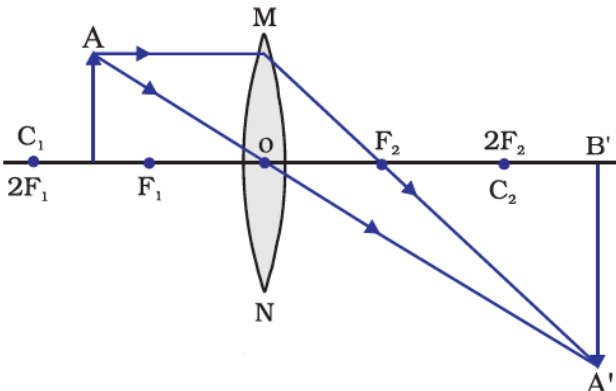
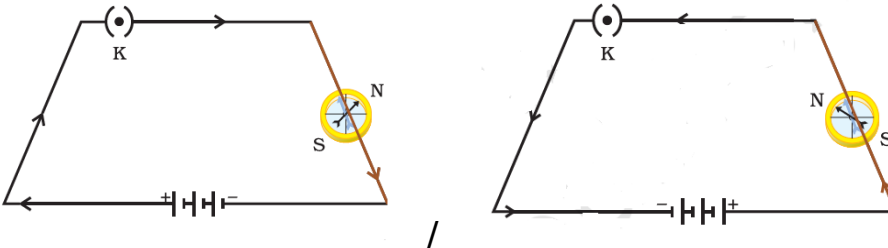


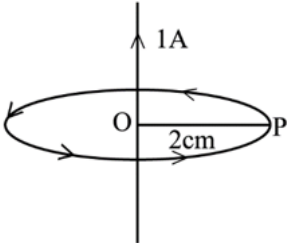
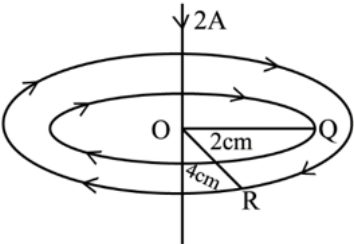
	<p>(ii) <math>\text{NaCl} + \text{H}_2\text{O} + \text{NH}_3 + \text{CO}_2 \longrightarrow \text{NaHCO}_3 + \text{NH}_4\text{Cl}</math></p> <p>(iii) <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \xrightarrow{373\text{K}} \text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + 1\frac{1}{2}\text{H}_2\text{O}</math> (Deduct <math>\frac{1}{2}</math> mark if no/ incorrect balancing in each case)</p>	1 1	3
28.	<p>(a) During electrolytic refining of a metal, the insoluble impurities which settle down at the bottom of the anode is called anode mud.</p> <p>(b) Anode: Impure copper rod Cathode: Pure copper strip</p> <p>(c) (i) <math>2\text{Cu}_2\text{S} + 3\text{O}_2(\text{g}) \xrightarrow{\text{heat}} 2\text{Cu}_2\text{O}(\text{s}) + 2\text{SO}_2(\text{g})</math>  <math>2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \xrightarrow{\text{heat}} 6\text{Cu}(\text{s}) + \text{SO}_2(\text{g})</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(c) (ii)</p> <p style="text-align: center;">(Diagram- 1 mark, Labelling-1 mark)</p>	1  $\frac{1}{2}$ $\frac{1}{2}$ 1 1  2	4
29.	<p>(a) (i)</p> <ul style="list-style-type: none"> <li>A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain./ Can be represented by a single general formula and successive members differ by <math>-\text{CH}_2</math> unit or 14u.</li> <li><math>\text{C}_2\text{H}_4</math> and <math>\text{C}_4\text{H}_8</math> belong to the same homologous series/ are alkenes.</li> </ul> <p>(ii) (I) <math>\text{CH}_3\text{CH}_2\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}</math>  (II) <math>\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \xrightarrow{\text{Burning}} 2\text{CO}_2 + 3\text{H}_2\text{O}</math>  (balancing may be ignored)</p> <p>(iii) The ionic end of soap interacts with water while the carbon chain interacts with oil/dirt. The soap molecules thus form a structure called micelle.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) (I) Propanone/acetone (II) Propyne</p> <p>(ii) Hydrogenation/addition reaction.</p> <p>(iii) <math>\text{C}_4\text{H}_{10}</math> will have higher melting point, as it has a higher molecular mass than <math>\text{C}_3\text{H}_8</math> and melting point increases with the increase in molecular mass.</p>	1  1  1 1  1  $\frac{1}{2}$ $\frac{1}{2}$ 1  1	

	<p>(iv) Sodium ethoxide (<math>\text{C}_2\text{H}_5\text{ONa}</math>) is formed and hydrogen gas is evolved</p> <p style="text-align: center;">/</p> $2\text{Na} + 2\text{CH}_3\text{CH}_2\text{OH} \rightarrow 2\text{CH}_3\text{CH}_2\text{O}^-\text{Na}^+ + \text{H}_2$ <p style="text-align: right;">(balancing may be ignored)</p> <p>(v) <math>\text{CH}_3\text{COON C}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}</math></p>	1	
		$\frac{1}{2} + \frac{1}{2}$	5
	<b>SECTION – C</b> <b>(Physics)</b>		
30.	(C) /Colour of ray 1- Red; Colour of ray 2 - Violet	1	1
31.	(B)/ current becomes $\frac{I}{4}$ and potential difference remains V.	1	1
32.	(D)/Assertion (A) is false, but Reason (R) is true.	1	1
33.	<p>(a) (i) Mainly blue coloured light is scattered because very fine particles scatter shorter wavelength.</p> <p>(ii) Scattered light may appear white because very large size particles scatter light of all wavelengths.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p>  <p>A natural spectrum like rainbow is formed when light ray passes through tiny water droplets. The water droplets disperse the incident sunlight, then reflect it internally and finally refract it again when it comes out of the raindrop.</p> <p style="text-align: right;">(any other phenomenon of spectrum in nature)</p>	1 1  1 1	2
34.	<p>(i)</p> 	1	

	<p>(ii)</p> 	1	2
35.	<p>(a) (i) Battery / Electric cell (ii) Rheostat / Variable resistance</p> <p>(b) Resistance of the heater, <math>R = \frac{V}{I}</math></p> $R = \frac{110}{5}$ $R = 22 \Omega$ <p>Current through the heater, <math>I' = \frac{V'}{R}</math></p> $= \frac{220}{22}$ $= 10 \text{ A}$ <p style="text-align: center;">/</p> <p><b>Alternate answer for (b):</b></p> <ul style="list-style-type: none"> <li>According to Ohm's law, potential difference is directly proportional to current.</li> <li>When the potential difference is doubled, current will also be doubled. So, value of current will be 10A.</li> </ul>	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1  1 1	3
36.	<p>(a) <math>4 \Omega</math> and <math>1 \Omega</math> are in series, <math>R_s = 4\Omega + 1 \Omega = 5 \Omega</math></p> <p>Resistance across R and S, <math>\frac{1}{R_1} = \frac{1}{5} + \frac{1}{5}</math></p> $R_1 = \frac{5}{2} \Omega$ <p><math>2 \Omega</math> and <math>3 \Omega</math> are in series, <math>R_{s1} = 2\Omega + 3 \Omega = 5 \Omega</math></p> <p>Resistance across P and Q, <math>\frac{1}{R_2} = \frac{1}{5} + \frac{1}{5}</math></p> $R_2 = \frac{5}{2} \Omega$ <p>Total resistance:</p> $R = R_1 + R_2$ $= \frac{5}{2} + \frac{5}{2}$ $= 5 \Omega$	1	



	<div></div> <p>(deduct ½ mark for no or incorrect direction of rays)</p>	2	4						
39.	<p>(a) (i) (I)</p> <ul style="list-style-type: none"><li>Fleming’s left hand rule.</li><li>Stretch the thumb, fore finger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and second finger in the direction of current then thumb will point the direction of force acting on the conductor.</li></ul> <p>(II)</p> <ul style="list-style-type: none"><li>Right hand thumb rule.</li><li>Imagine that you are holding a current carrying conductor in your right hand such that thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of field lines of magnetic field.</li></ul> <p>(ii)</p> <table><tr><th>Magnetic field due to bar magnet</th><th>Magnetic field due to current-carrying solenoid</th></tr><tr><td>Strength of magnetic field is constant.</td><td>Strength of magnetic field can be changed by changing the magnitude of current.</td></tr><tr><td>Direction of magnetic field cannot be changed without changing the orientation of magnet.</td><td>Direction of magnetic field can be changed by changing the direction of current.</td></tr></table> <p style="text-align: right;">(any one difference)</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)(i)</p> <div></div> <p>When current passes through a straight conductor, the compass needle placed near it shows deflection.</p>	Magnetic field due to bar magnet	Magnetic field due to current-carrying solenoid	Strength of magnetic field is constant.	Strength of magnetic field can be changed by changing the magnitude of current.	Direction of magnetic field cannot be changed without changing the orientation of magnet.	Direction of magnetic field can be changed by changing the direction of current.	<p>½</p> <p>1</p> <p>½</p> <p>1</p> <p>2</p> <p>1</p>	
Magnetic field due to bar magnet	Magnetic field due to current-carrying solenoid								
Strength of magnetic field is constant.	Strength of magnetic field can be changed by changing the magnitude of current.								
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	<p>(ii) (I)</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(A)</p> </div> <div style="text-align: center;">  <p>(B)</p> </div> </div> <p>(II) (1) magnetic field strength at Q is more than P.  (2) magnetic field strength at Q is more than R.</p>	<p><b>1</b></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><b>1</b> <b>1</b></p>	<p><b>5</b></p>
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**Marking Scheme**  
**Strictly Confidential**  
**(For Internal and Restricted use only)**  
**Secondary School Examination, 2026 (X<sup>th</sup>)**  
**SUBJECT NAME SCIENCE (Q.P. CODE /Set No 31/3/3)**

**General Instructions: -**

<b>1</b>	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.
<b>2</b>	<b>“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.”</b>
<b>3</b>	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. <b>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.</b>
<b>4</b>	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.
<b>5</b>	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.
<b>6</b>	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. <b>This is most common mistake which evaluators are committing.</b>
<b>7</b>	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 totalled up and written in the left-hand margin and encircled. This may be followed strictly.
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**MARKING SCHEME**  
**SCIENCE (Subject Code-086)**  
**(PAPER CODE: 31/3/3) (10-03-86K)**

Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total marks
	<b>SECTION – A</b> <b>(Biology)</b>		

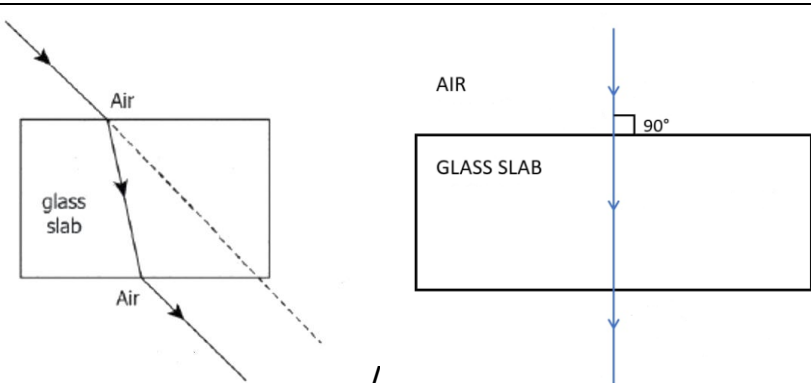
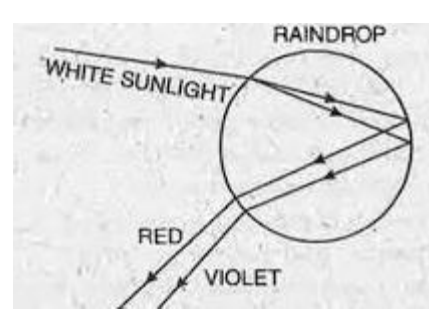




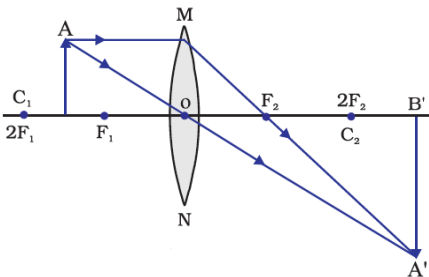
14.	<p>(a) Herbivores eat grass, need a longer small intestine to allow the cellulose to be digested.</p> <p>(b) The finger like projections on the inner lining of small intestine, the villi, increase the surface area for absorption of digested food.</p> <p>(c) Dissolved oxygen in water is much lower as compared to oxygen in air.</p>	<p>1</p> <p>1</p> <p>1</p>	3
15.	<p>(a) (i) Opening of stomata during the day is minimised to prevent loss of water by evaporation. / Transpiration (loss of water in the form of water vapour) is minimised.</p> <p>(ii) Stomata</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>• Absorption of light energy by Chlorophyll.</li> <li>• Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen</li> <li>• Reduction of Carbon Dioxide into Carbohydrates</li> </ul> <p>(ii) At night.</p> <p>(iii) Diagram of Open stomatal pore.</p> <div data-bbox="507 981 858 1236" data-label="Image"> <p>The diagram illustrates a cross-section of a leaf surface. Two kidney-shaped guard cells are shown, each containing several green chloroplasts. They are joined at their inner ends to form a central opening called the stomatal pore. Labels with leader lines point to the 'Guard cells', 'Stomatal pore', and 'Chloroplast'.</p> </div> <p style="text-align: right;">Diagram - 1 Mark Labelling - 1 Mark</p>	<p>2</p> <p>2</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>2</p>	4
16.	<p>(a) (i) Structure: <i>Bryophyllum</i> leaf Type: Vegetative propagation / Asexual reproduction</p> <p>(ii)</p> <ul style="list-style-type: none"> <li>• <u>Advantage</u>: Genetically identical plants, maintaining desirable traits of the parents. / Bear flowers and fruits earlier than those plants which are grown from seeds / Used for the plants that have lost their capacity to produce seeds. (Any one)</li> <li>• <u>Disadvantage</u>: No genetic variation</li> </ul> <p>(iii) As DNA of single parent is involved without gamete fusion. / Offsprings are produced by mitosis hence similar genetic makeup thus no variation.</p> <p>(iv) It creates genetic variation, enhances chances of survival in changing environment and drives evolution.</p> <p style="text-align: center;"><b>OR</b></p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p>1</p> <p>1</p>	

	(b) (i) Name: Multiple Fission Type: Asexual reproduction (ii) In stage P, many daughter cells are produced by multiple fission / Repeated nuclear divisions followed by cytoplasmic divisions. (iii) <i>Plasmodium</i> (or any other) (iv) Vegetative propagation <u>Advantages</u> – (1) All the plants produced are genetically similar to the parent plant (2) Such plants can bear flowers and fruits earlier than those produced from seeds. (or any other advantage)	½ ½ 1 ½ ½ 1 1	5
<b>SECTION – B</b> <b>(Chemistry)</b>			
17.	(A)/ 2,2	1	1
18.	(B)/ The reaction of a reactive metal with dilute acid.	1	1
19.	(C)/ Copper (II) chloride, which is blue-green in colour.	1	1
20.	(D)/ C <sub>3</sub> H <sub>8</sub>	1	1
21.	(C)/ Na <sub>2</sub> ZnO <sub>2</sub>	1	1
22.	(C)/ Exothermic, but the heat evolved is not sufficient for the hydrogen to catch fire.	1	1
23.	(D)/ Case (iii) only	1	1
24.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
25.	$\begin{array}{c} \text{Na} \rightarrow \text{Na}^+ + e^- \\ \text{2,8,1} \quad \text{2,8} \\ \text{(Sodium cation)} \end{array}$ $\begin{array}{c} \text{Cl} + e^- \rightarrow \text{Cl}^- \\ \text{2,8,7} \quad \text{2,8,8} \\ \text{(Chloride anion)} \end{array}$ $\text{Na} + \begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array} \longrightarrow [\text{Na}^+] \left[ \begin{array}{c} \times \times \\ \times \text{Cl}^- \times \\ \times \times \end{array} \right]$ <ul style="list-style-type: none"> <li>Because the movement of ions in solid NaCl is not possible due to its rigid structure.</li> </ul>	1 1	2
26.	(i) The process in which a metal is attacked by substances around it such as moisture, acids etc. (ii) Oxidation of fats and oils present in food resulting in change of its smell and taste. (iii) Reaction in which heat/energy is released along with the formation of products.	1 1 1	3
27.	(a) (i) When acid is added to water, it does not cause excessive local heating/ does not splash out and cause burns. (ii) Because dry HCl does not ionize/produce H <sup>+</sup> ions whereas in dilute HCl, H <sup>+</sup> ions are present. (iii) Because of loss of 5 molecules of water of crystallisation. <b>OR</b>	1 1 1 1	

	<p>(b) (i) <math>2\text{NaCl(aq)} + 2\text{H}_2\text{O(l)} \xrightarrow{\text{Electricity}} 2\text{NaOH(aq)} + \text{H}_2\text{(g)} + \text{Cl}_2\text{(g)}</math></p> <p>(ii) <math>\text{NaCl} + \text{H}_2\text{O} + \text{NH}_3 + \text{CO}_2 \longrightarrow \text{NaHCO}_3 + \text{NH}_4\text{Cl}</math></p> <p>(iii) <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \xrightarrow{373\text{K}} \text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + 1\frac{1}{2}\text{H}_2\text{O}</math> (balancing may be ignored)</p>	1 1 3	
28.	<p>(a) During electrolytic refining of a metal, the insoluble impurities which settle down at the bottom of the anode is called anode mud.</p> <p>(b) Anode: Impure copper rod Cathode: Pure copper strip</p> <p>(c) (i) <math>2\text{Cu}_2\text{S} + 3\text{O}_2\text{(g)} \xrightarrow{\text{heat}} 2\text{Cu}_2\text{O (s)} + 2\text{SO}_2\text{(g)}</math>  <math>2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \xrightarrow{\text{heat}} 6\text{Cu(s)} + \text{SO}_2\text{(g)}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(c) (ii)</p> <p style="text-align: center;">(Diagram- 1 mark, Labelling-1 mark)</p>	1  ½ ½ 1 1  2	
29.	<p>(a) (i)</p> <ul style="list-style-type: none"> <li>A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain. / Can be represented by a single general formula and successive members differ by -CH<sub>2</sub> unit or 14u.</li> <li>C<sub>2</sub>H<sub>4</sub> and C<sub>4</sub>H<sub>8</sub> belong to the same homologous series/ are alkenes.</li> </ul> <p>(ii)</p> <p>(I) <math>\text{CH}_3\text{CH}_2\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}</math></p> <p>(II) <math>\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \xrightarrow{\text{Burning}} 2\text{CO}_2 + 3\text{H}_2\text{O}</math> (balancing may be ignored)</p> <p>(iii) The ionic end of soap interacts with water while the carbon chain interacts with oil/dirt. The soap molecules thus form a structure called micelle.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) (I) Propanone/acetone (II) Propyne</p> <p>(ii) Hydrogenation/addition reaction.</p>	1 1 1 1 1  ½ ½ 1	

	<p>(iii) <math>C_4H_{10}</math> will have higher melting point, as it has a higher molecular mass than <math>C_3H_8</math> and Melting point increases with the increase in molecular mass.</p> <p>(iv) Sodium ethoxide (<math>C_2H_5ONa</math>) is formed and hydrogen gas is evolved</p> <p style="text-align: center;">/</p> $2Na + 2CH_3CH_2OH \rightarrow 2CH_3CH_2O^-Na^+ + H_2$ <p style="text-align: right;">(balancing may be ignored)</p> <p>(v) <math>CH_3COON C_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH</math></p>	<p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>	5
	<b>SECTION – C</b> <b>(Physics)</b>		
30.	(C)/ Ammeter in series and voltmeter in parallel.	1	1
31.	(C)/ Presbyopia and hypermetropia.	1	1
32.	(D)/Assertion (A) is false , but Reason (R) is true.	1	1
33.	 <p style="text-align: center;">/</p> <p style="text-align: center;">• <math>Refractive\ index = \frac{\sin i}{\sin r}</math></p>	<p>1</p> <p>1</p>	2
34.	<p>(a) (i) Mainly blue coloured light is scattered because very fine particles scatter shorter wavelength.</p> <p>(ii) Scattered light may appear white because very large size particles scatter light of all wavelengths.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p>  <p>A natural spectrum like rainbow is formed when light ray passes through tiny water droplets. The water droplets disperse the incident sunlight, then reflect it internally and finally refract it again when it comes out of the raindrop.</p> <p style="text-align: right;">(Any other phenomenon of spectrum in nature)</p>	<p>1</p> <p>1</p> <p>1</p>	2



	<p style="text-align: center;">/</p> <p>The same value of <math>\frac{V}{I}</math> is obtained from the graph for all corresponding points of V and I.</p> <p>(b) Wire B. The slope of B is higher, so it has higher resistance/ resistivity.</p>	<p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	<p>3</p>
<p>38.</p>	<p>(a) In observation no.3. The object distance is equal to image distance, which is only possible when the object is at <math>2F</math> (<math>C</math>) =50 cm. Therefore, the focal length is 25 cm.</p> <p>(b)</p> <ul style="list-style-type: none"> <li>• Observation no. 6</li> <li>• When object is kept between <math>F</math> and <math>O</math>, image formed by lens will be on same side of object. Hence, image distance(<math>v</math>) should be negative.</li> </ul> <p>(c) <math>m = \frac{v}{u}</math>  <math>= \frac{150}{-30}</math>  <math>m = -5</math></p> <p>Nature of image: Image will be real and inverted  Reason: because the value of <math>m</math> is negative.</p> <p style="text-align: center;"><b>OR</b></p> <p>(c)</p>  <p style="text-align: center;">(deduct <math>\frac{1}{2}</math> mark for no or incorrect direction of rays)</p>	<p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	<p>4</p>
<p>39.</p>	<p>(a) (i) Live wire - Red Neutral wire – Black Earth wire - Green</p> <p>(ii) 220V</p> <p>(iii) (I) Earth wire provides a low resistance conducting path for current and thus, protect us from electric shock due to leakage of electric current to metallic body of electrical appliances. (II) Fuse is a safety device which melts and breaks the electric circuit when unduly high electric current flows due to overloading and prevents damage to appliances and circuit.</p> <p style="text-align: center;"><b>OR</b></p>	<p>2</p> <p>1</p> <p>1</p> <p>1</p>	

