

**Marking Scheme****Strictly Confidential****(For Internal and Restricted use only)****Secondary School Certificate Examination, 2025****SUBJECT NAME: SCIENCE (Q.P. CODE 31/6/1)****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 totalled 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.
<b>9</b>	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> .
<b>10</b>	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 totaling 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 totaling on the title page.</li> <li>● Wrong totaling 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> <li>● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</li> </ul>
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 “ <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 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)**

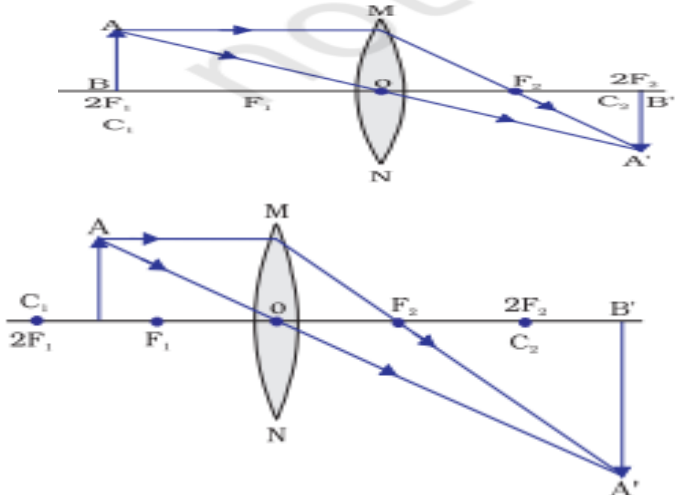
**[ Paper Code: 31/6/1]**

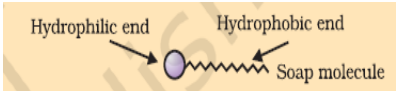

**Maximum Marks: 80**

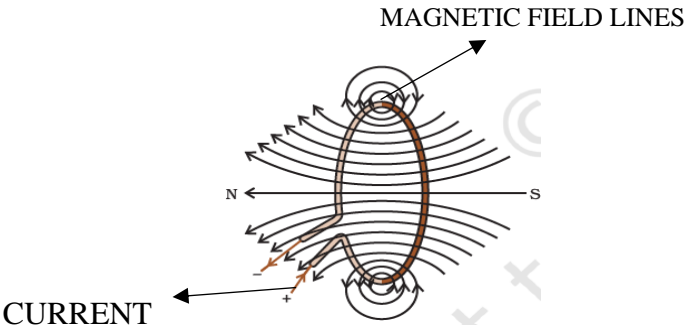
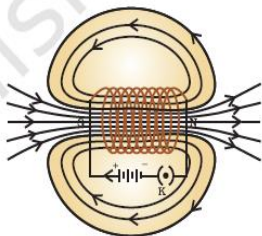
<b>Q. No.</b>	<b>EXPECTED ANSWERS / VALUE POINTS</b>	<b>Marks</b>	<b>Total Marks</b>
<b>SECTION A</b>			
1	(C)/(i) and (iii)	1	1
2	(D) / $B < A < C$	1	1
3	(C) / It is an endothermic reaction	1	1
4	(C)/ $C_7H_{14}$	1	1
5	(B) / Pale green	1	1
6	(D) / Tartaric acid	1	1
7	(B) / (ii) and (iii)	1	1
8	(D) / 100% tall with round seeds	1	1
9	(D) / Hypothalamus and Pineal	1	1
10	(C) / P – 3, Q – 4, R – 1, S – 2	1	1
11	(A) / Nephron	1	1
12	(B) / Hydrochloric acid, Pepsin and Mucus	1	1
13	(C)	1	1
14	(D) Pupil	1	1
15	(D) / 5000 kJ	1	1
16	(C) / It is used as a refrigerant and in fire-extinguishers	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	(A) / Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).	1	1
20	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
<b>SECTION B</b>			
21	<ul style="list-style-type: none"> <li>• P – Fe</li> <li>• Q – Zn / Mg</li> <li>• Chemical reaction:  <math>FeSO_4 + Zn \longrightarrow ZnSO_4 + Fe</math> /  <math>FeSO_4 + Mg \rightarrow MgSO_4 + Fe</math> </li> <li>• More reactive metal will displace less reactive metal from its salt solution. / Zn or Mg are more reactive than Fe.</li> </ul>	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
22	(a) Brain is protected in bony box / skull / cranium / fluid filled balloon.  (b) Region of brain: Hind brain and its part is cerebellum.	1  $\frac{1}{2} + \frac{1}{2}$	2
23	(a)The height of plant depends upon amount of particular plant hormone. This hormone depends upon the efficiency of enzyme (protein) which depends upon a DNA sequence (gene). If the enzyme works efficiently, lot of hormones are made and the plant will be tall.	2	
<b>OR</b>			

	(b) Each cell has two copies of each chromosome, one each from male and female parents. During gamete formation, the gamete takes one chromosome from each pair. When two such gametes having a single set of genes combine together, they restore the normal number of chromosomes in the progeny ensuring the stability of DNA of the species. <b>(Any other explanation)</b>	2	2
24	(a) Medium 2  (b) Ray bends away from the normal because it is travelling from optically denser medium to rarer medium / speed of light in medium 2 increases.  (c) $n_{21} = \frac{\text{Speed of light in medium 1}}{\text{Speed of light in medium 2}}$	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
25	(a) (i) Scattering of light is not prominent at such heights. (ii) The red colour is least scattered by smoke or fog. / Red colour has longer wavelength. <b>OR</b> (b) <ul style="list-style-type: none"> <li>Rainbow is a natural spectrum appearing in the sky after a rain shower.</li> <li>After rain, small water droplets act as a tiny prism, when light enters, it gets refracted and dispersed.</li> </ul>	1 1 1 1	2
26	Ponds or lakes have natural cleansing agents like microbes which clean the ponds or lakes. whereas an aquarium or a swimming pool is an artificial/man-made ecosystem and do not have decomposers. If we do not clean the aquarium regularly the waste material will go on increasing which is harmful for fishes and aquatic plants.	1 1	2
<b>SECTION C</b>			
27	(a) $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$  (b) $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}$  (c) $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \longrightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy}$	1 1 1	3
28	(a) (i) Baking soda is used as an antacid because it is a mild non-corrosive basic salt hence neutralises excess acid.  (ii) Baking soda liberates carbon dioxide ( $\text{CO}_2$ ) gas on reaction with mild edible acid.  (iii) In fire extinguishers, it acts as a base to react with acid to produce carbon dioxide ( $\text{CO}_2$ ) gas to extinguish fire. <b>OR</b> (b) <p>(i) <math>\text{Zn} + 2\text{HCl} \longrightarrow \text{ZnCl}_2 + \text{H}_2</math></p> <p style="text-align: center;">Metal    Acid                      Zinc chloride</p>	1 1 1 1	

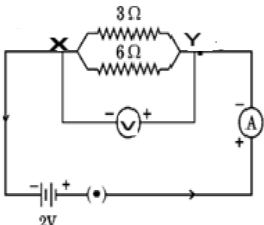
	<div>(ii) <math>2\text{NaOH} + \text{H}_2\text{SO}_4 \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}</math> Base                  Acid                  Sodium Sulphate</div> <div>(iii) <math>\text{Na}_2\text{CO}_3 + 2\text{HCl} \longrightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2</math> Salt                  Acid                  Sodium chloride</div> <div>(Any other relevant equation in all three) (Give marks if written with carbonate ion)</div>	1					
		1					
			3				
29	<div>(i) Pulmonary vein</div> <div>(ii) Vena cava</div> <div><ul style="list-style-type: none"><li>• Right atrium</li><li>• After receiving blood, the right atrium contracts</li><li>• As a result blood passes into the right ventricle</li><li>• Then the ventricle contracts and the deoxygenated blood flows into the lungs through pulmonary artery.</li></ul></div>	<div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2} \times 3</math></div>	3				
30	<div>(a) All plants were purple flowered/ No mixed coloured flowers were observed / No white flowered plants were observed / Only dominant parental trait was observed.</div> <div>(Any two observations)</div> <div>(b) (i) 25%</div> <div>(ii) 1 : 2 : 1 / 1WW:2Ww:1ww</div> <div>(c)</div> <div><table><tr><td>Dominant Trait</td><td>Recessive Trait</td></tr><tr><td>A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always</td><td>A trait that remains unexpressed in the presence of its contrasting form.</td></tr></table></div> <div>(Any other difference)</div>	Dominant Trait	Recessive Trait	A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always	A trait that remains unexpressed in the presence of its contrasting form.	<div><math>\frac{1}{2} \times 2</math></div> <div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div> <div>1</div>	3
Dominant Trait	Recessive Trait						
A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always	A trait that remains unexpressed in the presence of its contrasting form.						
31	<div>(a) Focal length = + 15 cm (Ignore units)</div> <div>Reason: when object distance and image distance are same i.e. object is at 2F, image is also formed at 2F on the other side ∴ 2f = 30 cm</div> <div>(b) Observation No. 8</div> <div>Reason: here the object is between optical centre and principal focus of the lens hence image is formed on the same side as the object and v is not equal to + 120 cm. (it should be -120 cm)</div> <div>(c) Ray diagram</div> <div></div>	<div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div> <div><math>\frac{1}{2}</math></div>					

	 <p style="text-align: center;"><b>Any one ray diagram</b></p>	1	3
32	<p>(a) Hypermetropia</p> <p>(b) Two causes:</p> <ul style="list-style-type: none"> <li>• Eye ball has become too small /Eye ball is shortened</li> <li>• The focal length of the eye Lens is long / eye lens becomes less convergent</li> </ul> <p>(c) Focal length = <math>\frac{1}{P}</math>  <math>= \frac{1}{2} = +0.5 \text{ m}</math></p>	1  $\frac{1}{2} \times 2$  $\frac{1}{2}$  $\frac{1}{2}$	3
33	<p>(a) It means 1 joule of work is done to move a charge of 1 coulomb from one point of the conductor to the other.</p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>• Ammeter.</li> <li>• Ammeter is used to measure electric current</li> </ul> <p>(ii)</p> <ul style="list-style-type: none"> <li>• Rheostat or variable resistance</li> <li>• Rheostat is used in a circuit to vary the resistance of the circuit</li> </ul>	1  $\frac{1}{2}$ $\frac{1}{2}$  $\frac{1}{2}$ $\frac{1}{2}$	3
<b>SECTION D</b>			
34	<p>(a) • Ethanol and Ethanoic acid</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> <math display="block">  \begin{array}{c}  \text{H} \quad \text{H} \\    \quad   \\  \text{H} - \text{C} - \text{C} - \text{OH} \\    \quad   \\  \text{H} \quad \text{H}  \end{array}  </math> </div> <div style="margin: 0 10px;">/</div> <div style="text-align: center;"> <math>\text{CH}_3\text{CH}_2\text{OH},</math> </div> </div> <div style="display: flex; align-items: center; justify-content: center; margin-top: 20px;"> <div style="text-align: center;"> <math display="block">  \begin{array}{c}  \text{H} \\    \\  \text{H} - \text{C} - \text{C} \\    \quad // \quad \backslash \\  \text{H} \quad \text{O} \quad \text{OH}  \end{array}  </math> </div> <div style="margin: 0 10px;">/</div> <div style="text-align: center;"> <math>\text{CH}_3\text{COOH}</math> </div> </div> <ul style="list-style-type: none"> <li>• On adding alkaline <math>\text{KMnO}_4</math> /acidified <math>\text{K}_2\text{Cr}_2\text{O}_7</math> to alcohol, it gets oxidised to Carboxylic acid.</li> <li>• An Ester is formed</li> </ul>	$\frac{1}{2} + \frac{1}{2}$  $\frac{1}{2}$  $\frac{1}{2}$  $\frac{1}{2}$	

	$\text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{heat}]{\text{Alkaline KMnO}_4} \text{CH}_3\text{COOH}$ $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow[\text{Catalyst}]{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ <p style="text-align: center;"><b>OR</b></p> <p>(b) • Soaps are sodium or potassium salts of long chain carboxylic acids.</p> <ul style="list-style-type: none"> <li>   </li> </ul> <p>soap molecule consists of a hydrophobic(water repelling)end and a hydrophilic (water loving)end.</p> <ul style="list-style-type: none"> <li>Most dirt is oily in nature, oil does not dissolve in water. The ionic-end (hydrophilic) of soap interacts with water while the carbon chain(hydrophobic) interacts with oil. The soap molecules react with dirt, thus form structures called micelles. This forms an emulsion in water. The soap micelle thus helps in pulling out the dirt in water and we can wash our clothes clean</li> <li>Hard water contains salts of Ca and Mg, which reacts with soap to form scum (an insoluble substance) and no foam is formed</li> <li>we can overcome this problem by using detergents as cleaning agents. / By removing hardness of water.</li> </ul>	1	
		1	
		1	
		1	
		1	
		1	5
35	<p>(a) When the rate of general body growth begins to slow down and reproduction tissues begin to mature – This period of adolescence is called puberty.</p> <ul style="list-style-type: none"> <li>Changes in boys:</li> </ul> <p>Cracking of voice/Thick hair growth on face / Penis occasionally begins to become enlarge and erect /Thick hair growing in the genital area or arm pits. <b>(Any two)</b></p> <p>(b)As sperm formation requires a temperature which is lower than normal body temperature, that is why testes are located outside the abdominal cavity in scrotum.</p> <p>(c) Three techniques of contraception:</p> <ul style="list-style-type: none"> <li>Mechanical barrier /Condom</li> <li>Chemical method /Oral pills</li> <li>Loop or copper T inside uterus</li> <li>Surgical methods /Blockage of Vas deferens or fallopian tube</li> </ul> <p style="text-align: right;"><b>(Any three)</b></p> <ul style="list-style-type: none"> <li>Not meant for males: Oral pills / Loop or Copper T</li> </ul> <p>(a) <b>OR</b></p> <p>(i) Ovary</p>	1	
		½ x 2	
		1	
		½ x 3	
		½	

	<p>(ii) Oviduct / fallopian tube (iii) Uterus (iv) Vagina / Vaginal passage</p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>• Zygote starts dividing in the uterus.</li> <li>• Thickened Uterine lining which is richly supplied with blood vessels nourishes the developing embryo.</li> <li>• Placenta develops, which provides oxygen, food to the embryo and removes waste substances.</li> </ul> <p>(ii) The uterine lining slowly breaks down and comes out as blood and mucous along with unfertilised egg.</p>	<p><math>\frac{1}{2} \times 4</math></p> <p><math>\frac{1}{2}</math> <math>\frac{1}{2}</math> <math>\frac{1}{2}</math></p> <p><math>1 \frac{1}{2}</math></p>	5
36	<p>(a) Magnetic field lines are the imaginary lines around the magnet</p> <ul style="list-style-type: none"> <li>• Magnetic field line directions at a point are determined by placing a small compass needle.</li> <li>• Figure of magnetic field produced by a current carrying circular coil –</li> </ul>  <p style="text-align: center;"><b>(1 Mark for each labelling)</b></p> <ul style="list-style-type: none"> <li>• Amount of the electric current flowing through it.</li> <li>• The number of turns in the circular coil</li> <li>• The radius of circular coil</li> </ul> <p style="text-align: right;"><b>(Any two)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>(b) • There will be two directions of the field at the same point i.e. the point where the two field lines intersect which is not possible. / At the point of intersection, the compass needle would point towards two directions, which is not possible.</p>  <ul style="list-style-type: none"> <li>• Magnetic field lines are equidistant and parallel i.e. the magnetic field is the same at all points inside the solenoid.</li> <li>• Number of turns</li> </ul>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	



	<ul style="list-style-type: none"> <li>Amount of current in solenoid,</li> <li>Core material inside the solenoid</li> </ul> <p align="right"><b>(Any two)</b></p>	1x2	5
	<b>SECTION E</b>		
37	<p>(I) Both electrical conductivity and melting point of an alloy becomes less than that of a pure metal. (Although in some cases the melting point may increases)</p> <p>(II)</p> <ul style="list-style-type: none"> <li>Solder</li> <li>Lead (Pb) &amp; tin (Sn)</li> </ul> <p>(III) (a)</p> <ul style="list-style-type: none"> <li>An alloy is a homogenous mixture of two or more metals or a metal and a nonmetal.</li> <li>Brass is an alloy is prepared by mixing Copper and Zinc in definite proportion.</li> </ul> <p align="center"><b>OR</b></p> <p>(III) (b)</p> <ul style="list-style-type: none"> <li>Stainless steel is an alloy of steel (iron) mixed with nickel and chromium.</li> <li>Iron is first mixed with small amount of carbon (0.05%) so that it becomes hard and strong when, then it is mixed with Ni and Cr metals, stainless steel is formed.</li> <li>Do not rust</li> </ul> <p><b>(or any other property)</b></p>	<p>1</p> <p>1/2 1/2</p> <p>1 1</p> <p>1</p> <p>1/2 1/2</p>	4
38	<p>(I) 'X' – Positive geotropism/ Negative Phototropism 'Y' – Negative geotropism / Positive Phototropism</p> <p>(II) (i) Absciscic acid (ii) Cytokinin</p> <p>(III) (a)</p> <ul style="list-style-type: none"> <li>The plants use electrical- chemical means to convey information (touch) from cell to cell.</li> <li>Plant cells change shape by changing the amount of water in them, resulting in swelling /shrinking of cells.</li> </ul> <p align="center"><b>OR</b></p> <p>(III) (b)</p> <ul style="list-style-type: none"> <li>Auxin</li> <li>When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoots. This concentration of Auxin stimulates the cells to grow longer, on the side of the shoot which is away from light. Thus the plant appears to bend towards light.</li> </ul>	<p>1/2 1/2</p> <p>1/2 1/2</p> <p>1 1</p> <p>1</p> <p>1</p>	4
39	<p>(I)</p>  <p align="right"><b>(or Any other way)</b></p> <p>(II)</p> <p>(i) in parallel combination.</p>	<p>1</p> <p>1/2</p>	

	(ii) in series combination.	$\frac{1}{2}$	
	(III) (a) Resistance $R = 3\ \Omega + 6\ \Omega = 9\ \Omega$	1	
	$V = 2V$		
	$I = \frac{V}{R} = \frac{2\ V}{9\ \Omega} = 0.22\ A$	1	
	<b>OR</b>		
	(b) $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R}$	$\frac{1}{2}$	
	$= \frac{1}{3\ \Omega} + \frac{1}{6\ \Omega}$	$\frac{1}{2}$	
	$= \frac{6 + 3}{18\ \Omega}$		
	$\therefore R = 2\text{ohm}$	1	4

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<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.
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<b>9</b>	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> .
<b>10</b>	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

11	A full scale of marks <b>80</b> (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 totaling 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 totaling on the title page.</li> <li>• Wrong totaling 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> <li>• Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</li> </ul>
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 “ <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 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)**

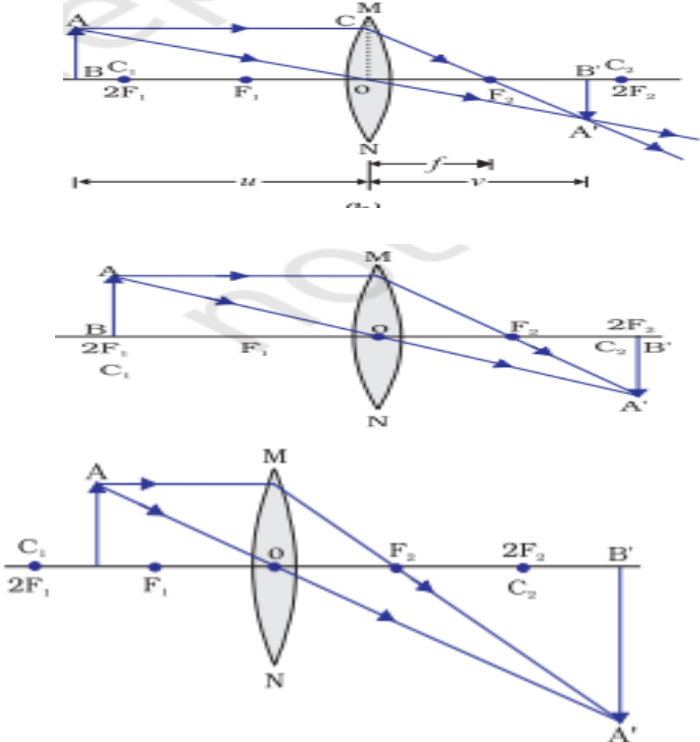
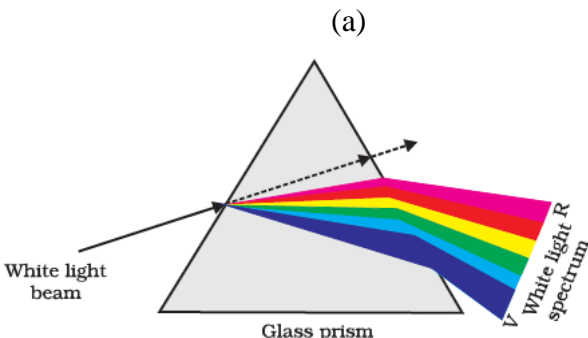
**[ Paper Code: 31/6/2]**

**Maximum Marks: 80**

<b>Q. No.</b>	<b>EXPECTED ANSWERS / VALUE POINTS</b>	<b>Marks</b>	<b>Total Marks</b>
	<b>SECTION A</b>		
1	(C) / C <sub>7</sub> H <sub>14</sub>	1	1
2	(D) / Na <sub>2</sub> CO <sub>3</sub> · 10H <sub>2</sub> O	1	1
3	(C) / (i) and (iii)	1	1
4	(C) / It is an endothermic reaction	1	1
5	(B) / (ii) and (iii)	1	1
6	(C) / Neutral	1	1
7	(B) / Pale green	1	1
8	(A) / Self-pollinating F <sub>1</sub> generation plants.	1	1
9	(A) / Nephron	1	1
10	(D) / Plumule	1	1
11	(D) / Hypothalamus and Pineal	1	1
12	(C)	1	1
13	(B) / Hydrochloric acid, Pepsin and Mucus	1	1
14	(D) / Outer surface of cornea	1	1
15	(C) / It is used as a refrigerant and in fire-extinguishers	1	1
16	(D) / Can synthesize food by photosynthesis	1	1
17	(C) / Assertion (A) is true, but Reason (R) is false	1	1
18	(C) / Assertion (A) is true, but Reason (R) is false.	1	1
19	(A) / Both Assertion (A) and Reason (R) are true, and Reason (R) is 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
	<b>SECTION B</b>	1	1
21	<p>‘X’ is Mercury.</p> <p>Reaction involved in its extractions are:</p> $2 \text{HgS} + 3 \text{O}_2 \xrightarrow{\Delta} 2 \text{HgO} + 2 \text{SO}_2$ $2 \text{HgO} \xrightarrow{\Delta} 2 \text{Hg} + \text{O}_2$	<p>1</p> <p>½</p> <p>½</p>	2
22	<p>(a) The height of plant depends upon amount of particular plant hormone. This hormone depends upon the efficiency of enzyme (protein) which depends upon a DNA sequence (gene). If the enzyme works efficiently, lot of hormones are made and the plant will be tall.</p> <p align="center"><b>OR</b></p> <p>(b) Each cell has two copies of each chromosome, one each from male and female parents. During gamete formation, the gamete takes one chromosome from each pair. When two such gametes having a single set of genes combine together, they restore the normal number of chromosomes in the progeny ensuring the stability of DNA of the species.</p> <p align="right"><b>(Any other explanation)</b></p>	<p>2</p> <p>2</p>	2

23	(a) Brain is protected in bony box / skull / cranium / fluid filled balloon.  (b) Region of brain: Hind brain and its part is cerebellum.	1  $\frac{1}{2} + \frac{1}{2}$	2				
24	(a) (i) Scattering of light is not prominent at such heights. (ii) The red colour is least scattered by smoke or fog. / Red colour has longer wavelength.  <b>OR</b> (b) Rainbow is a natural spectrum appearing in the sky after a rain shower. After rain, small water droplets act as a tiny prism, when light enters, it gets refracted and dispersed.	1  1  1  1	2				
25	(a) Medium 2  (b) Ray bends away from the normal because it is travelling from optically denser medium to rarer medium / speed of light in medium 2 increases.  (c) $n_{21} = \frac{\text{Speed of light in medium 1}}{\text{Speed of light in medium 2}}$	$\frac{1}{2}$  $\frac{1}{2}$  1	2				
26	<ul style="list-style-type: none"><li>Flow of energy: Sun <math>\longrightarrow</math> Producer <math>\longrightarrow</math> Herbivore <math>\longrightarrow</math> Carnivore</li><li>The energy flow always progresses from one trophic level to another and does not revert back / energy captured by autotrophs does not revert back to solar input / the energy which passes to the herbivore does not come back to autotrophs.</li></ul>	1  1	2				
<b>SECTION C</b>							
27	(a) All plants were purple flowered/ No mixed coloured flowers were observed / No white flowered plants were observed / Only dominant parental trait was observed.  <b>(Any two observations)</b>  (b) (i) 25% (ii) 1 : 2 : 1 / 1WW:2Ww:1ww (c) <table border="1"><tr><td><b>DOMINANT TRAIT</b></td><td><b>RECESSIVE TRAIT</b></td></tr><tr><td>A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always</td><td>A trait that remains unexpressed in the presence of its contrasting form.</td></tr></table> <b>(Any other difference)</b>	<b>DOMINANT TRAIT</b>	<b>RECESSIVE TRAIT</b>	A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always	A trait that remains unexpressed in the presence of its contrasting form.	$\frac{1}{2} \times 2$  $\frac{1}{2}$ $\frac{1}{2}$  1	3
<b>DOMINANT TRAIT</b>	<b>RECESSIVE TRAIT</b>						
A trait that can express itself in the presence of its unexpressed contrasting trait / Trait express itself always	A trait that remains unexpressed in the presence of its contrasting form.						
28	(a) (i) (1) $H^+$ ion concentration maximum in Solution D. (2) $OH^-$ ion concentration maximum in Solution B.  (ii) Example of D: HCl/ $H_2SO_4$ / $HNO_3$ Example of B : NaOH / KOH  <b>(Any other)</b>	$\frac{1}{2}$ $\frac{1}{2}$  $\frac{1}{2}$ $\frac{1}{2}$					

	<p>(iii) When a strong acid and a strong base are mixed in equal proportions, the resulting solution will have a pH of 7, it will be neutral.</p> <ul style="list-style-type: none"> <li>Reason- The acid and base neutralize each other completely, forming water molecules and leaving no excess hydrogen or hydroxide ions</li> </ul> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>Hydrogen</li> <li>Hydrogen burns with a pop sound</li> </ul> <p>(ii) (1) <math>\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2</math> Zinc Chloride</p> <p>(2) <math>\text{Zn} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2</math> Sodium Zincate</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} + \frac{1}{2}</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>	3
29	<p>Position: <math>\frac{1}{v} - \frac{1}{u} = \frac{1}{f}</math></p> $\frac{1}{v} - \frac{1}{-30} = \frac{1}{+20}$ $\frac{1}{v} + \frac{1}{30} = \frac{1}{20} \Rightarrow v = +60 \text{ cm}$ <p>position is 60 cm from the lens</p> <p>Size: <math>m = \frac{h_i}{h_o} = \frac{v}{u}</math></p> $= \frac{60}{-30} = -2$ <p><math>h_i = -2 \times 5 \text{ cm} = -10 \text{ cm}</math></p> <p>size of image is 10 cm(Enlarged)</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><math>\frac{1}{2}</math></p>	3
30	<p>(a) <math>3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2</math></p> <p>(b) <math>\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}</math></p> <p>(c) <math>\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \longrightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy}</math></p>	<p>1</p> <p>1</p> <p>1</p>	3
31	<p>(a) It means 1 joule of work is done to move a charge of 1 coulomb from one point of the conductor to the other.</p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>Ammeter.</li> <li>Ammeter is used to measure electric current</li> </ul> <p>(ii)</p> <ul style="list-style-type: none"> <li>Rheostat or variable resistance</li> </ul> <p>Rheostat is used in a circuit to vary the resistance of the circuit</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>	3
32	<p>(a) Focal length = + 15 cm <b>(Ignore units)</b></p> <p>Reason: when object distance and image distance are same i.e. object is at 2F, image is also formed at 2F on the other side</p> <p><math>\therefore 2f = 30 \text{ cm}</math></p> <p>(b) Observation No. 8</p> <p>Reason: here the object is between optical centre and principal focus of the lens hence image is formed on the same side as the object and v is not equal to + 120 cm. (it should be -120 cm)</p> <p>(c) Ray diagram</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>(– Any one ray diagram )</p>	1	3
33	<p>(a)</p>  <p>(b) The band of seven colours obtained on the screen after dispersion of white light Reason: Different components of white light (colours) bend through different angles with respect to the incident ray as they pass through a prism</p>	1 1 1	3
SECTION D			
34	<p>(a) When the rate of general body growth begins to slow down and reproduction tissues begin to mature – This period of adolescence is called puberty.</p> <ul style="list-style-type: none"> <li>Changes in boys: Cracking of voice/Thick hair growth on face / Penis occasionally begins to become enlarge and erect /Thick hair growing in the genital area or arm pits. (Any two)</li> </ul> <p>(b)As sperm formation requires a temperature which is lower than normal body temperature, that is why testes are located outside the abdominal cavity in scrotum.</p> <p>(c)Three techniques of contraception:</p>	1  ½ x2  1	



	<ul style="list-style-type: none"> <li>• Mechanical barrier /Condom</li> <li>• Chemical method /Oral pills</li> <li>• Loop or copper T inside uterus</li> <li>• Surgical methods /Blockage of Vas deferens or fallopian tube (Any three)</li> <li>• Not meant for males: Oral pills / Loop or Copper T</li> </ul> <p>(a) <b>OR</b></p> <p>(i) Ovary (ii) Oviduct / fallopian tube (iii) Uterus (iv) Vagina / Vaginal passage</p> <p>(b) (i)</p> <ul style="list-style-type: none"> <li>• Zygote starts dividing in the uterus.</li> <li>• Thickened Uterine lining which is richly supplied with blood vessels nourishes the developing embryo.</li> <li>• Placenta develops which supplies oxygen, food and removes waste matter from mother to embryo.</li> </ul> <p>(ii) The uterine lining slowly breaks down and comes out as blood and mucous along with unfertilised egg.</p>	<p><math>\frac{1}{2} \times 3</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2} \times 4</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>1 \frac{1}{2}</math></p>	5
35	<p>(a) • Ethanol and Ethanoic acid</p> $  \begin{array}{c}  \text{H} \quad \text{H} \\    \quad   \\  \text{H} - \text{C} - \text{C} - \text{OH} \\    \quad   \\  \text{H} \quad \text{H}  \end{array}  \quad / \quad  \text{CH}_3\text{CH}_2\text{OH},  $ $  \begin{array}{c}  \text{H} \\    \\  \text{H} - \text{C} - \text{C} \\    \quad // \quad \backslash \\  \text{H} \quad \text{O} \quad \text{OH}  \end{array}  \quad / \quad  \text{CH}_3\text{COOH}  $ <ul style="list-style-type: none"> <li>• On adding alkaline <math>\text{KMnO}_4</math> /acidified <math>\text{K}_2\text{Cr}_2\text{O}_7</math> to alcohol, it gets oxidises to Carboxylic acid .</li> <li>• An Ester is formed/esterification reaction</li> </ul> $  \text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{heat}]{\text{Alkaline KMnO}_4} \text{CH}_3\text{COOH}  $ $  \text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow[\text{Catalyst}]{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}  $ <p><b>OR</b></p> <p>(b) • Soaps are sodium or potassium salts of long chain carboxylic acids.</p>	<p><math>\frac{1}{2} + \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>	

	<div data-bbox="284 80 679 170" data-label="Chemical-Block"> </div> <div data-bbox="715 80 1155 174" data-label="Chemical-Block"> </div> <p data-bbox="236 197 1031 264">molecule consists of a hydrophobic(water repelling)end and a hydrophilic (water loving)end.</p> <ul data-bbox="284 271 1155 636" style="list-style-type: none"> <li>• Most dirt is oily in nature, oil does not dissolve in water. The ionic-end (hydrophilic) of soap interacts with water while the carbon chain(hydrophobic) interacts with oil. The soap molecules reacts with dirt, thus form structures called micelles. This forms an emulsion in water. The soap micelle thus helps in pulling out the dirt in water and we can wash our clothes clean</li> <li>• Hard water contains salts of Ca and Mg, which reacts with soap to form scum (an insoluble substance) and no foam is formed</li> <li>• We can overcome this problem by using detergents as cleaning agents. / By removing hardness of water.</li> </ul>	<div data-bbox="1203 85 1219 112" data-label="Text">1</div> <div data-bbox="1203 304 1219 331" data-label="Text">1</div> <div data-bbox="1203 524 1219 551" data-label="Text">1</div> <div data-bbox="1203 595 1219 622" data-label="Text">1</div>	5
36	<p data-bbox="236 658 272 685">(a)</p> <p data-bbox="236 696 1155 797">(i) Deflection of a compass needle, when placed near a current-carrying straight wire/the electric current through the conductor produces a magnetic effect</p> <p data-bbox="236 808 1070 875">(ii) If the direction of the current is reversed, the compass needle deflects in the opposite direction</p> <div data-bbox="331 864 751 1133" data-label="Diagram"> </div> <p data-bbox="236 1144 571 1171">(b) Right hand thumb rule</p> <p data-bbox="236 1182 1166 1323">Rule: Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current, then the fingers will wrap around the conductor in the direction of the field lines of the magnetic field.</p> <p data-bbox="660 1335 708 1361" style="text-align: center;"><b>OR</b></p> <p data-bbox="236 1391 320 1417">(a) (i)</p> <div data-bbox="320 1429 708 1626" data-label="Image"> </div> <p data-bbox="236 1641 277 1668">(ii)</p> <div data-bbox="480 1697 836 1906" data-label="Image"> </div>	<div data-bbox="1203 712 1219 739" data-label="Text">1</div> <div data-bbox="1203 819 1219 846" data-label="Text">1</div> <div data-bbox="1203 981 1219 1008" data-label="Text">1</div> <div data-bbox="1203 1151 1219 1178" data-label="Text">1</div> <div data-bbox="1203 1258 1219 1285" data-label="Text">1</div> <div data-bbox="1203 1456 1219 1482" data-label="Text">1</div> <div data-bbox="1203 1792 1219 1818" data-label="Text">1</div>	

	Two differences: <table><tr><td>BAR MAGNET</td><td>CURRENT CARRYING SOLONEOID</td></tr><tr><td>Strength of magnetic field is fixed</td><td>Strength of magnetic field can be changed</td></tr><tr><td>Polarity is fixed</td><td>Polarity can be changed</td></tr></table> (b) Magnetic force of the electron is : (i)Maximum in Case A electron moving perpendicular to magnetic field. (ii)Minimum in Case C electron moving in direction opposite to the direction of magnetic field	BAR MAGNET	CURRENT CARRYING SOLONEOID	Strength of magnetic field is fixed	Strength of magnetic field can be changed	Polarity is fixed	Polarity can be changed	1  
BAR MAGNET	CURRENT CARRYING SOLONEOID							
Strength of magnetic field is fixed	Strength of magnetic field can be changed							
Polarity is fixed	Polarity can be changed							

	<div data-bbox="403 91 703 320" data-label="Diagram"> </div> <p>(or Any other way)</p> <p>(II)</p> <p>(i) in parallel combination.</p> <p>(ii) in series combination.</p> <p>(III) (a) Resistance <math>R = 3\ \Omega + 6\ \Omega = 9\ \Omega</math></p> <p><math>V = 2V</math></p> <p><math>I = \frac{V}{R} = \frac{2\ V}{9\ \Omega} = 0.22\ A</math></p> <p><b>OR</b></p> <p>(b) <math>\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R}</math></p> <p><math>= \frac{1}{3\ \Omega} + \frac{1}{6\ \Omega}</math></p> <p><math>= \frac{6 + 3}{18\ \Omega}</math></p> <p><math>\therefore R = 2\text{ohm}</math></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><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p>4</p>
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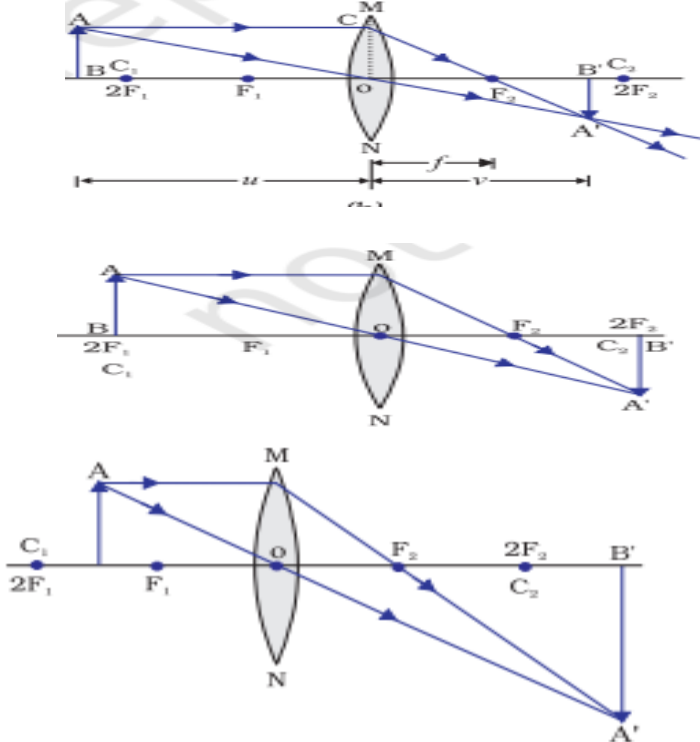
<p style="text-align: center;"><b>Marking Scheme</b></p> <p style="text-align: center;"><b>Strictly Confidential</b></p> <p style="text-align: center;"><b>(For Internal and Restricted use only)</b></p> <p style="text-align: center;"><b>Secondary School Certificate Examination, 2025</b></p> <p style="text-align: center;"><b>SUBJECT NAME SCIENCE (Q.P. CODE 31/6/3)</b></p>	
<b><u>General Instructions: -</u></b>	
<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.
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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 totaling 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 totaling on the title page.</li> <li>• Wrong totaling 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> <li>• Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</li> </ul>
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 <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 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.

**[ Paper Code: 31/6/3]**

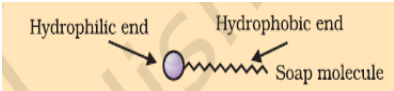
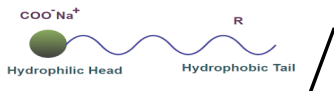
	<p>(b)</p> <ul style="list-style-type: none"> <li>Rainbow is a natural spectrum appearing in the sky after a rain shower.</li> </ul> <p>After rain, small water droplets act as a tiny prism, when light enters, it gets refracted and dispersed.</p>	1 1	2
24	<p>(a) The height of plant depends upon amount of particular plant hormone. This hormone depends upon the efficiency of enzyme (protein) which depends upon a DNA sequence (gene). If the enzyme works efficiently, lot of hormones are made and the plant will be tall.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) Each cell has two copies of each chromosome, one each from male and female parents. During gamete formation, the gamete takes one chromosome from each pair. When two such gametes having a single set of genes combine together, they restore the normal number of chromosomes in the progeny ensuring the stability of DNA of the species.</p> <p style="text-align: center;"><b>(Any other explanation)</b></p>	2  2	2
25	<p>(a) Brain is protected in bony box / skull / cranium / fluid filled balloon.</p> <p>(b) Region of brain: Hind brain and its part is cerebellum.</p>	1  $\frac{1}{2} + \frac{1}{2}$	 2
26	<p>1%</p> <ul style="list-style-type: none"> <li>Most of the energy is lost as heat to the environment and some amount goes into digestion, growth &amp; reproduction of that trophic level.</li> <li>An average of 10% is turned into its own body and made available for the next level / primary consumer</li> </ul>	1  1	 2
<b>SECTION C</b>			
27	<p>Because energy is released during the process of respiration.</p> $\text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \longrightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O} + \text{Energy}$ <p style="text-align: center;"><b>(Balancing of equation)</b></p>	1  1 1	  3
28	<p>(a) (i) Baking soda is used as an antacid because it is a mild non-corrosive basic salt hence neutralises excess acid.</p> <p>(ii) Baking soda liberates carbon dioxide (CO<sub>2</sub>) gas on reaction with mild edible acid.</p> <p>(iii) In fire extinguishers, it acts as a base to react with acid to produce carbon dioxide (CO<sub>2</sub>) gas to extinguish fire.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p> <p>(i) <math>\text{Zn} + 2\text{HCl} \longrightarrow \text{ZnCl}_2 + \text{H}_2</math></p> <p style="margin-left: 40px;">Metal    Acid</p> <p style="margin-left: 150px;">Zinc chloride</p> <p>(ii) <math>2\text{NaOH} + \text{H}_2\text{SO}_4 \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}</math></p> <p style="margin-left: 40px;">Base            Acid                    Sodium Sulphate</p>	1  1  1  1  1	



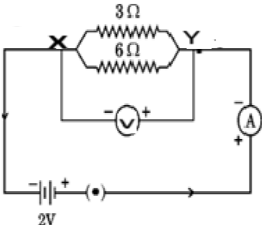
	<p>(iii) <math>\text{Na}_2\text{CO}_3 + 2\text{HCl} \longrightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2</math></p> <p style="text-align: center;">Salt                  Acid                  Sodium chloride</p> <p style="text-align: center;"><b>(Any other relevant equation in all three)</b>  <b>(Give marks if written with carbonate ion)</b></p>	1	3
29	<p>(a) Focal length = + 15 cm (Ignore units)</p> <p>Reason: when object distance and image distance are same i.e. object is at 2F, image is also formed at 2F on the other side  <math>\therefore 2f = 30 \text{ cm}</math></p> <p>(b) Observation No. 8</p> <p>Reason: here the object is between optical centre and principal focus of the lens hence image is formed on the same side as the object and v is not equal to + 120 cm. ( it should be -120 cm)</p> <p>(c) Ray diagram</p>  <p style="text-align: right;">– Any one ray diagram</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

30	<p style="text-align: center;">( any other flow diagram)</p> <p>(b) In few reptiles, the temperature at which fertilised eggs are kept determines whether the animals developing in the eggs will be male or female. / In other animals, such as snails, individuals can change sex</p>	2	
31	<p>(i) Pulmonary vein</p> <p>(ii) Vena cava</p> <ul style="list-style-type: none"> <li>Right atrium</li> <li>After receiving blood, the right atrium contracts</li> <li>As a result, blood passes into the right ventricle</li> <li>When the right ventricle contracts and the deoxygenated blood flows into the lungs through pulmonary artery.</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} \times 3</math></p>	3
32	<p>(a) Myopia / Near Sightedness/ Short sightedness</p> <p>(b) Two causes:</p> <ul style="list-style-type: none"> <li>Excessive curvature of eye lens</li> <li>Eye ball is elongated</li> </ul> <p>(c) <math>f(m) = 1/P = 1/-0.5 = -2 \text{ m}</math></p>	<p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p>	3
33	<p>(a) It means 1 joule of work is done to move a charge of 1 coulomb from one point of the conductor to the other.</p> <p>(b) (i) Ammeter. Ammeter is used to measure electric current</p> <p>(ii) Rheostat or variable resistance Rheostat is used in a circuit to vary the resistance of the circuit</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>	3
<b>SECTION D</b>			
34	<p>(a) Magnetic field lines are the imaginary lines around the magnet</p> <ul style="list-style-type: none"> <li>Magnetic field line directions at a point are determined by placing a small compass needle.</li> <li>Figure of magnetic field produced by a current carrying circular coil –</li> </ul> <p style="text-align: right;">MAGNETIC FIELD LINES</p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	

	<div data-bbox="453 120 997 412" data-label="Image"> </div> <p>(1 Mark for each labelling)</p> <ul style="list-style-type: none"> <li>Amount of the electric current flowing through it.</li> <li>The number of turns in the circular coil</li> <li>The radius of circular coil</li> </ul> <p>(Any two)</p> <p><b>OR</b></p> <p>(b) • There will be two directions of the field at the same point i.e. the point where the two field lines intersect which is not possible. / At the point of intersection, the compass needle would point towards two directions, which is not possible.</p> <div data-bbox="632 864 895 1099" data-label="Image"> </div> <ul style="list-style-type: none"> <li>Magnetic field lines are equidistant and parallel i.e. the magnetic field is the same at all points inside the solenoid.</li> <li>Number of turns</li> <li>Amount of current in solenoid,</li> <li>Core material inside the solenoid</li> </ul> <p>(Any two)</p>	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1x2</p>	<p>5</p>
35	<p>(a) Binary Fission</p> <ul style="list-style-type: none"> <li>Amoeba splits into two parts in any plane of the body</li> <li>In Leishmania, division occurs in a definite orientation in relation to the structure.</li> </ul> <p>(b) Asexual reproduction is the process of producing new organisms from a single parent/without the involvement of sex cells or gamete</p> <p>Budding:</p> <ul style="list-style-type: none"> <li>A bud develops due to repeated cell division at one specific site.</li> <li>These buds develop into tiny individuals and when they mature, they get detached from the parent body as new independent individuals. / or explanation through diagram</li> </ul> <p>(c) Layering and grafting</p> <p><b>OR</b></p> <p>(a)(i) Attract insects for pollination (ii) Produces pollen grains</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>	

	<p>(iii) Provides the path through which the pollen tube grows and reaches the ovary</p> <p>(iv) Contains ovules which has an egg cell / female gamete</p> <p>(b) Unisexual flower – Papaya / Watermelon Bisexual flower – Hibiscus / Mustard <b>(Any other)</b></p> <p>Post fertilization changes:</p> <ul style="list-style-type: none"> <li>• Zygote divides several times to form an embryo within the ovule.</li> <li>• Ovule develops a tough coat and changes into a seed.</li> <li>• Ovary grows rapidly and ripens to form a fruit.</li> <li>• Petals, sepals, stamens and style, etc. shrivel/dry and fall off</li> </ul>	<p><math>\frac{1}{2} \times 4</math></p> <p><math>\frac{1}{2}</math> <math>\frac{1}{2}</math></p> <p><math>\frac{1}{2} \times 4</math></p>	5
36	<p>(a) • Ethanol and Ethanoic acid</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> <math display="block">\begin{array}{c} \text{H} &amp; \text{H} \\   &amp;   \\ \text{H} - \text{C} &amp; - \text{C} - \text{OH} \\   &amp;   \\ \text{H} &amp; \text{H} \end{array}</math> </div> <div style="font-size: 2em; margin: 0 10px;">/</div> <div style="text-align: center;"> <math>\text{CH}_3\text{CH}_2\text{OH},</math> </div> </div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> <math display="block">\begin{array}{c} \text{H} &amp; &amp; \text{O} \\   &amp; &amp; // \\ \text{H} - \text{C} &amp; - &amp; \text{C} \\   &amp; &amp; \backslash \\ \text{H} &amp; &amp; \text{OH} \end{array}</math> </div> <div style="font-size: 2em; margin: 0 10px;">/</div> <div style="text-align: center;"> <math>\text{CH}_3\text{COOH}</math> </div> </div> <ul style="list-style-type: none"> <li>• On adding alkaline <math>\text{KMnO}_4</math> /acidified <math>\text{K}_2\text{Cr}_2\text{O}_7</math> to alcohol, it gets oxidises to Carboxylic acid .</li> <li>• An Ester is formed</li> </ul> $\text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{heat}]{\text{Alkaline KMnO}_4} \text{CH}_3\text{COOH}$ $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow[\text{Catalyst}]{\text{Acid}} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ <p style="text-align: center;"><b>OR</b></p> <p>(b) • Soaps are sodium or potassium salts of long chain carboxylic acids.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;">  </div> <div style="font-size: 2em; margin: 0 10px;">/</div> <div style="text-align: center;">  </div> </div> <p>soap molecule consists of a hydrophobic(water repelling)end and a hydrophilic (water loving)end.</p> <ul style="list-style-type: none"> <li>• Most dirt is oily in nature, oil does not dissolve in water. The ionic-end (hydrophilic) of soap interacts with water while the carbon chain(hydrophobic) interacts with oil. The soap molecules reacts with dirt, thus form structures called micelles. This forms an emulsion in water. The soap micelle</li> </ul>	<p><math>\frac{1}{2} + \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>1</p> <p>1</p> <p>1</p> <p>1</p>	



	 <p>(or Any other way)</p>	1	
(II)	<p>(i) in parallel combination.</p> <p>(ii) in series combination.</p>	1/2 1/2	
(III)	<p>(a) Resistance <math>R = 3\ \Omega + 6\ \Omega = 9\ \Omega</math></p> <p><math>V = 2V</math></p> <p><math>I = \frac{V}{R} = \frac{2\ V}{9\ \Omega} = 0.22\ A</math></p> <p><b>OR</b></p> <p>(b) <math>\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R}</math></p> <p><math>= \frac{1}{3\ \Omega} + \frac{1}{6\ \Omega}</math></p> <p><math>= \frac{6 + 3}{18\ \Omega}</math></p> <p><math>\therefore R = 2\text{ohm}</math></p>	1     1/2  1/2  1	4

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