

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2026 (2nd Board Examination)
SUBJECT NAME : Science 086
(Q.P. CODE / Set No. 31/7/1)

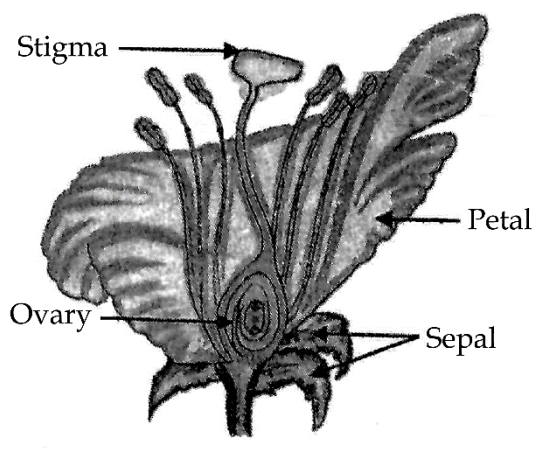
General Instructions: -

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. Its leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .

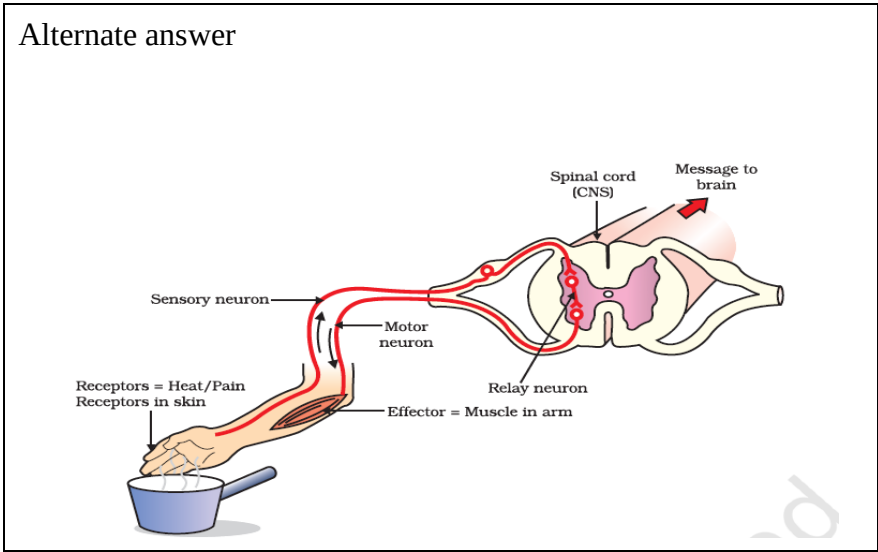
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks 80 (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past :- • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “ Guidelines for Spot Evaluation ” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.
19	If a candidate attempts both alternatives/options in a question where only one option/alternative is required to be attempted, the Evaluator shall award marks in both the options. The system will take the higher of two scores and disregard the other response.
20	In a question having two options/alternatives, if a candidate has attempted only one, then the evaluator shall mark “NA” (Not attempted) against the option that has not been attempted by the candidate.

MARKING SCHEME
Science (Subject Code - 086)
(PAPER CODE : 31/7/1)

Q. No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
	Section (A) Biology		
1.	(A) Pepsin.	1	1
2.	(C) it transports food to different parts of the plant body.	1	1
3.	(C) Rapid growth of part of the tendril away from the point of contact With the support.	1	1
4.	(C) Thyroxin	1	1
5.	(D) (ii) and (iv)	1	1
6.	(C) 3 yellow : 1 green	1	1
7.	(D) Storage of food in root and stem.	1	1
8.	(C) A is true, R is false.	1	1
9.	(B) Both A and R are true by R is not the correct explanation of A	1	1
10.	$\bullet \quad \text{O}_2 \xrightarrow{\text{UV}} \text{O} + \text{O}$ $\text{O}_2 + \text{O} \rightarrow \text{O}_3$ (Ozone) Alternate Answer - The higher energy UV radiations split apart some molecular oxygen (O₂) into free oxygen atoms which then combine with the molecular Oxygen (O₂) to form Ozone. - Role: It prevents harmful UV rays to reach earth's atmosphere. - CFCs (Chlorofluorocarbons)	1 ½ ½	2
11.	(a) - No. of chromosomes in Zygote: 48 - When the two gametes combine during sexual reproduction, it results in re-establishment of number of chromosomes. / - By fertilisation to form zygote OR	1 1	

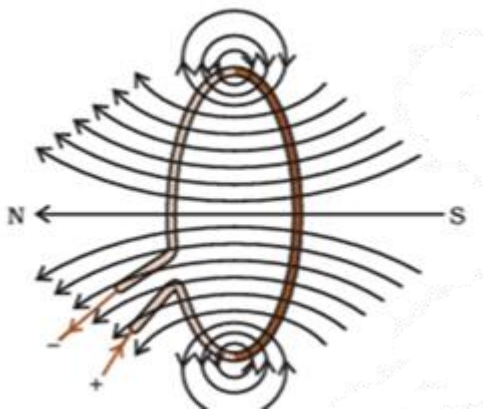
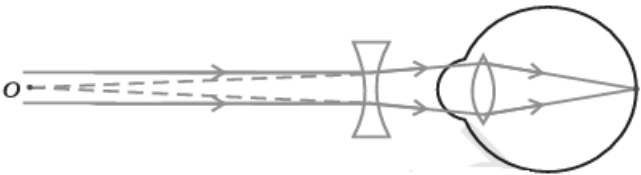
	(b) 	$\frac{1}{2} \times 4$	2
12.	(i) (a) <i>Hydra</i> (b) <i>Bryophyllum</i> (ii) Asexual reproduction. (iii) New generation or new individuals can be created from a single parent / produces many offsprings in lesser time.	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
13.	(a) Ethanol+ Carbon dioxide + energy (b) Lactic acid + energy (c) Carbon dioxide + water + energy	1 1 1	3
14.	(a) When waste is not segregated at source, it gets accumulated and materials like plastic will not be biodegraded. It may clog drains, pollute rivers and oceans and cause harm to cattle, fishes etc. (Or any other) (b) Because crop fields are man-made ecosystem and in this living organisms interact with each other and also with the abiotic components of the ecosystem. (c) These chemicals are non-biodegradable, hence keep getting accumulated at each trophic level, increasing progressively. As human beings occupy the top level in a food chain, the maximum concentration of these chemicals get accumulated in them. Phenomena is Biological magnification.	1 1 $\frac{1}{2}$ $\frac{1}{2}$	3
15.	(a) Deoxyribo nucleic acid (b) Meiosis / Reductional division	1 1	

	(c) (i) India has variety of climatic conditions variations in wheat varieties will enable farmers to grow crop according to best suited variety in a particular climate. It will give benefit of survival and better grain quality. OR (c)(ii) A section of DNA provides information for one protein, is called gene for that protein. For example, plant height depends on hormones that trigger growth. Its quantity will be determined by efficiency of enzyme that is needed for the synthesis of this hormone. If the gene has any variation, making it less efficient, it will make enzyme less efficient less hormone and hence short plant.	2							
		2	4						
16.	(a) (i) - Electrical impulses reach only those cells which are connected by nervous tissue not each and every cell in the body. - Once an electrical impulse is generated in a cell and transmitted, the cell will take some time to reset its mechanism before it can generate and transmit a new impulse. (ii) (I) <table> <tr> <th>Movement in ‘Touch – me – not’ plant</th> <th>Movement in animals</th> </tr> <tr> <td>1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this</td> <td>1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins.</td> </tr> <tr> <td>2.Plant cells change shape due changing amount of water resulting in swelling or shrinking</td> <td>2. In animals muscles contract & relax to bring movements</td> </tr> </table> (II) Chemotropism. OR (b) (i) Receptor → Sensory neuron → (CNS) Spinal cord ↓ Effector ← Motor neuron ← Relay neuron	Movement in ‘Touch – me – not’ plant	Movement in animals	1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this	1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins.	2.Plant cells change shape due changing amount of water resulting in swelling or shrinking	2. In animals muscles contract & relax to bring movements	1+1	
Movement in ‘Touch – me – not’ plant	Movement in animals								
1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this	1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins.								
2.Plant cells change shape due changing amount of water resulting in swelling or shrinking	2. In animals muscles contract & relax to bring movements								
		2							
		1							
		2							

	Alternate answer  (ii) (I) Cerebrum / Fore brain (II) Cerebellum (III) Medulla in hindbrain	1 1 1	5
	Section B (Chemistry)		
17.	(C) Al	1	1
18.	(C) Characteristic smell of burning sulphur	1	1
19.	(B) Aldehyde	1	1
20.	(A) I and II	1	1
21.	(A) Hydrophilic head and a hydrophobic tail.	1	1
22.	(C) Sour and change blue litmus to red.	1	1
23.	(C) Catenation	1	1
24.	(D) A is false but R is true.	1	1
25.	X- Sodium bicarbonate/sodium hydrogen carbonate/NaHCO_3 Y- Carbon dioxide/CO_2 gas $\text{NaHCO}_3(\text{s}) + \text{HCl}(\text{aq}) \rightarrow \text{NaCl}(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
26.	(a) A - $\text{C}_2\text{H}_5\text{OH}$/ Ethanol $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \quad \\ \text{H} \quad \text{H} \end{array}$ B - CH_3COOH /Ethanoic acid/ acetic acid	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	

	$\begin{array}{c} \text{H} \quad \text{O} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \\ \text{H} \end{array}$ C- $\text{CH}_3\text{COOC}_2\text{H}_5$ /Ethyl ethanoate/ ethyl acetate/ester $\begin{array}{c} \text{H} \quad \text{O} \quad \quad \text{H} \quad \text{H} \\ \quad \quad \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \quad \\ \text{H} \quad \quad \quad \text{H} \quad \text{H} \end{array}$ Alternate answer $\text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{K}_2\text{Cr}_2\text{O}_7]{\text{Acidified}} \text{CH}_3\text{COOH}$ Ehanol(A) Ethanoic acid (B) $\text{A} + \text{B} \xrightarrow[\text{H}_2\text{SO}_4]{\text{conc}} \text{C} \quad (\text{CH}_3\text{COOC}_2\text{H}_5)$ Ester Ethyl ethanoate/ethyl acetate OR (b) (i) Unsaturated hydrocarbons having double or triple bonds have a strong tendency to become saturated. / Unsaturated hydrocarbons are reactive and undergo addition reactions. (ii) Long chain of hydrocarbon in detergents does not form insoluble precipitate with Calcium or Magnesium ions of hard water and hence they remain effective even in hard water. (iii) Carbon is tetravalent. It can neither form C^{4+} cation nor C^{4-} anion. It completes its octet by sharing its valence electrons with other atoms of carbon or other elements forming covalent bonds.	$\frac{1}{2}$ $\frac{1}{2}$ 1+1 1	3
27.	(a) Combination reaction The beaker becomes hot because a large amount of heat is released during the reaction/ it is a highly exothermic reaction. (b) $\begin{array}{ccc} \text{CaO} + \text{H}_2\text{O} & \rightarrow & \text{Ca(OH)}_2 + \text{Heat} \\ \text{Quick lime} & & \text{slaked lime} \end{array}$	1 1 1	

28.	(a) • $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ / $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$ • Calcium sulphate hemihydrate (b) • Washing soda / Sodium carbonate • $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (c) (i) (I) Fixed number of water molecules present in one formula unit of salt. (II) $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$ OR (c) (ii) (I) Vanilla / Onion / Clove / Olfactory indicator (any other suitable example) (II) - In textile industry / paper industry as a bleaching agent. - as an oxidising agent in chemical industries - as a disinfectant (any one and any other)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 1 1	4
29.	(a) (i) (I) $2\text{HgS}(\text{s}) + 3\text{O}_2(\text{g}) \xrightarrow{\text{Heat}} 2\text{HgO}(\text{s}) + 2\text{SO}_2(\text{g})$ $2\text{HgO}(\text{s}) \xrightarrow{\text{Heat}} 2\text{Hg}(\text{l}) + \text{O}_2(\text{g})$ (II) $\text{ZnCO}_3(\text{s}) \xrightarrow{\text{Heat}} \text{ZnO}(\text{s}) + \text{CO}_2(\text{g})$ $\text{ZnO}(\text{s}) + \text{C}(\text{s}) \rightarrow \text{Zn}(\text{s}) + \text{CO}(\text{g})$ (III) At cathode $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$ At anode $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$ (ii) (I) Because movement of ions in solid state is not possible due to its rigid structure. (II) A large amount of heat energy is required to overcome strong electrostatic forces of attraction between oppositely charged ions in ionic compounds. OR b) (i) • Cathode – Thin strip of pure zinc metal • Anode – Impure zinc metal	1 1 1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$	

	 • Factors : (i) Amount of current flowing (ii) Number of turns of loop (iii) Radius of loop (any two)	1	
		$\frac{1}{2} + \frac{1}{2}$	2
35.	• Reasons: (i) Excessive curvature of eye lens (ii) Elongation of eye ball (a) Myopic eye  (b) Correction 	$\frac{1}{2} + \frac{1}{2}$	
		1	
		1	3
36.	• Refraction of light by the earth's atmosphere due to variation in optical density of different layers of air is called as atmospheric refraction. (a) The starlight, on entering the earth's atmosphere undergoes refraction continuously in a medium of gradually increasing refractive index and we see the apparent position of the star. Since the physical conditions of atmosphere are not stationary, the apparent position of the star fluctuates and gives twinkling effect.	1	
		1	

	(b) The air just above the fire becomes hotter than the air further up. The hotter air is lighter (less dens) than cooler air above it and has a refractive index slightly less than that of cooler air. Since the physical conditions of refracting medium are not stationary, the apparent position of objects, as seen through hot air fluctuates. And we see flickering objects.	1	3
37.	- Fuse – It is used to protect the appliances from overloading (Short circuiting). - Green colour wire – Earth wire – Provides a low resistance conducting path for current to flow to the earth, if there is any leakage of current to metallic body of appliance, hence prevents from electric shock. - Fuse will not be able to protect the circuit during overloading	1 1 1	3
38.	(a) Glass slab shows no dispersion because the colours dispersed by first refracting surface recombine and emerge out as white light at the second surface. In a glass prism different colours bend at different angles hence shows dispersion (b) Tiny water droplets act like prism. They refract and disperse the sunlight to show spectrum. (c) (i) With change in angle of incidence, angle of refraction will also change. Hence refractive index remains constant. Refractive index = $\frac{\text{speed of light in air}}{\text{speed of light in given medium}}$ Hence speed of light in that medium will also remain constant. OR (c) (ii) $n = \frac{\sin i}{\sin r}$ $n = \frac{\sin 60^\circ}{\sin 30^\circ} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$ $n = \frac{\text{speed of light in air}}{\text{speed of light in medium}}$ $\sqrt{3} = \frac{3 \times 10^8}{v}$ $v = \frac{3 \times 10^8}{\sqrt{3}}$ $v = \sqrt{3} \times 10^8 \text{ m/s}$	1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	4

39.	(a) (i) - Electric power is defined as the rate at which electrical energy is consumed in an electric circuit. - S.I unit is watt. (ii) Electrical energy consumed=Power× time Electrical energy consumed by heater in 1 day $E=1500 \times 4 = 6000 \text{ Wh} = 6 \text{ kWh}$ Electrical energy consumed by heater in 30 days = $6 \times 30 = 180 \text{ kWh}$ Electrical energy consumed by oven in 1 day = $1.5 \times 3 = 4.5 \text{ kWh}$ Electrical energy consumed by oven in 30 days = $4.5 \times 30 = 135 \text{ kWh}$ Total energy consumed in whole month = $180 + 135 = 315 \text{ kWh}$ Total energy consumed in joules = $315 \times 3.6 \times 10^6 = 1134 \times 10^6 \text{ J}$ (iii) Total cost = Total energy consumed × Cost of 1 unit $= 315 \times 7 = \text{Rs. } 2205$ OR (b) (i) Electrical resistivity is the resistance offered by a wire of length 1m and area of cross-section 1 m^2 (ii) $V = I R$ $V = 300 \times R \text{ -----(1)}$ $R \propto l$ $R_1 = 3 \times R$ $V = I_1 R_1$ $V = I_1 \times 3 R \text{ -----(2)}$ From (1) and (2) $I_1 \times 3 R = 300 \times R$ $I_1 = 100 \text{ mA (Reading of ammeter)}$ (iii) $R = \rho \frac{l}{A}$ $R = \frac{2.65 \times 10^{-8} \times 500}{1 \times 10^{-3}}$ $R = 2.65 \times 5 \times 10^{-3} \Omega$ $R = 13.25 \times 10^{-3} \Omega$	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1	5
-----	--	--	---

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2026 (2nd Board Examination)
SUBJECT NAME : Science 086
(Q.P. CODE / Set No. 31/7/2)

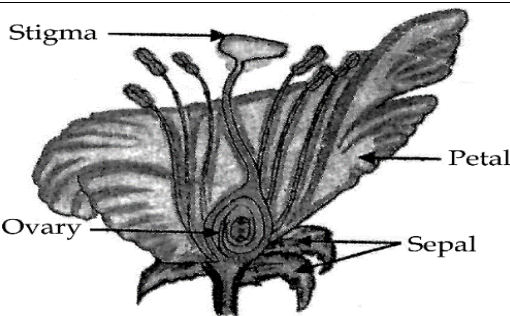
General Instructions: -

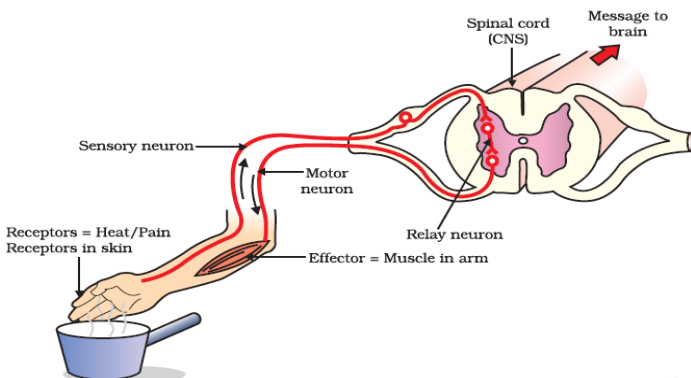
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. Its leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

11	A full scale of marks 80 (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past :- • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “ Guidelines for Spot Evaluation ” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.
19	If a candidate attempts both alternatives/options in a question where only one option/alternative is required to be attempted, the Evaluator shall award marks in both the options. The system will take the higher of two scores and disregard the other response.
20	In a question having two options/alternatives, if a candidate has attempted only one, then the evaluator shall mark “NA” (Not attempted) against the option that has not been attempted by the candidate.

MARKING SCHEME
Science (Subject Code - 086)
(PAPER CODE : 31/7/2)

Q. No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
	Section (A) Biology		
1.	(C) Rapid growth of part of the tendril away from the point of contact with the support.	1	1
2.	(D) Storage of food in roots and stems.	1	1
3.	(A) Pituitary	1	1
4.	(C) It transports food to different parts of the plant body.	1	1
5.	(C) 3 yellow : 1 green	1	1
6.	(D) (ii) and (iv)	1	1
7.	(D) Peristalsis	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.	(a) - No of chromosomes in Zygote: 48 - When the two gametes combine during sexual reproduction, it results in re-establishment of number of chromosomes. / - By fertilisation to form zygote	1 1	2
11.	(i) (a) <i>Hydra</i> (b) <i>Bryophyllum</i> (ii) Asexual reproduction. (iii) New generation or new individuals can be created from a single parent / produces many off springs in lesser time. (any other) OR (b)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	

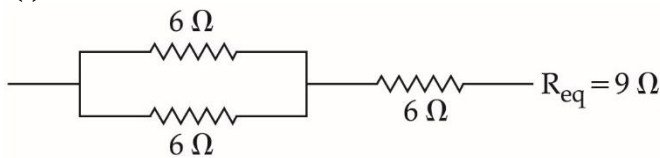
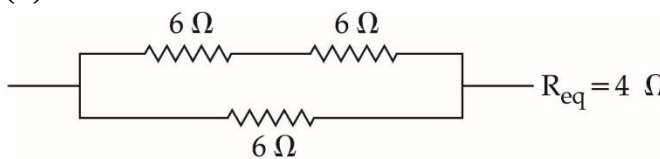
	 Stigma Petal Ovary Sepal	$\frac{1}{2} \times 4$	2
12.	Trypsin is secreted by Pancreas (gland) and it digests proteins. Bile juice is secreted by liver (gland) and it emulsifies fats.	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	2
13.	(a) When waste is not segregated at source, it gets accumulated and materials like plastic will not be biodegraded. It may clog drains, pollute rivers and oceans and cause harm to cattle, fishes etc. (Or any other) (b) Because crop fields are manmade ecosystem and in this living organisms interact with each other and also with the abiotic components of the ecosystem. (c) These chemicals are non-biodegradable, hence keep getting accumulated at each trophic level, increasing progressively. As human beings occupy the top level in a food chain, the maximum concentration of these chemicals get accumulated in them. Phenomenon is Biological magnification.	1 1 $\frac{1}{2}$ $\frac{1}{2}$	3
14.	(a) Grafting for grapes and rose. (b) Many parts of the plants like – stem, root and leaves can develop into new plant. (c) Pollen grains produce / carry male gametes for fertilization in plants.	1 1 1	3
15.	(a) Deoxyribo nucleic acid (b) Meiosis / Reductional division	1 1	

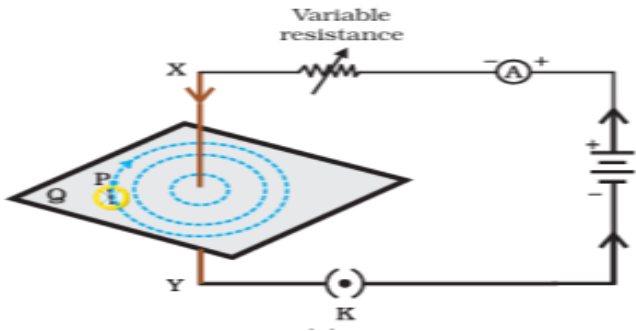
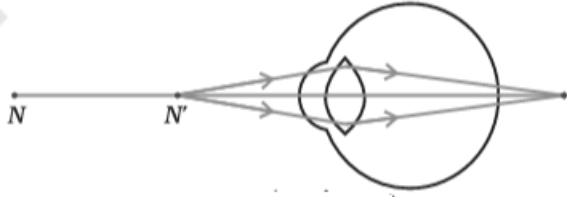
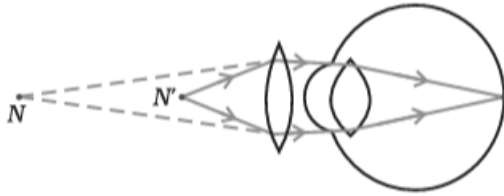
	(c) (i) India has variety of climatic conditions variations in wheat varieties will enable farmers to grow crop according to best suited variety in a particular climate. It will give benefit of survival and better grain quality. OR (c)(ii) A section of DNA provides information for one protein, is called gene for that protein. For example, plant height depends on hormones that trigger growth. Its quantity will be determined by efficiency of enzyme that is needed for the synthesis of this hormone. If the gene has any variation, making it less efficient, it will make enzyme less efficient less hormone and hence short plant.	2	
	(c)(ii) A section of DNA provides information for one protein, is called gene for that protein. For example, plant height depends on hormones that trigger growth. Its quantity will be determined by efficiency of enzyme that is needed for the synthesis of this hormone. If the gene has any variation, making it less efficient, it will make enzyme less efficient less hormone and hence short plant.	2	4
16.	(a) (i) Receptor → Sensory neuron → (CNS) Spinal cord ↓ Effector ← Motor neuron ← Relay neuron Alternate answer  The diagram illustrates a reflex arc. A hand is shown touching a hot object (a blue pot). Receptors in the skin detect heat/pain. A sensory neuron carries the signal to the spinal cord (CNS). Inside the spinal cord, a relay neuron connects to a motor neuron, which carries the signal back to the effector (muscle in the arm). A red arrow also points from the spinal cord towards the brain, labeled 'Message to brain'. (ii) (I) Cerebrum / Fore brain (II) Cerebellum (III) Medulla in hindbrain OR (b) (i) - Electrical impulses reach only those cells which are connected by nervous tissue not each and every cell in the body. - Once an electrical impulse is generated in a cell and transmitted, the cell will take some time to reset its mechanism before it can generate and transmit a new impulse. (ii)	2	
		1 1 1	
		1+1	

	(I)					
	<table><tr><th>Movement in ‘Touch – me – not’ plant</th><th>Movement in animals</th></tr><tr><td>1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this 2.Plant cells change shape due changing amount of water resulting in swelling or shrinking</td><td>1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins. 2. In animals muscles contract & relax to bring movements</td></tr></table>	Movement in ‘Touch – me – not’ plant	Movement in animals	1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this 2.Plant cells change shape due changing amount of water resulting in swelling or shrinking	1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins. 2. In animals muscles contract & relax to bring movements	2
Movement in ‘Touch – me – not’ plant	Movement in animals					
1. It uses electro – chemical means to convey the information of touch from cell to cell and there is no specialised tissue for this 2.Plant cells change shape due changing amount of water resulting in swelling or shrinking	1. In animals there is specialised tissue (muscles) for movements which change shape due to special proteins. 2. In animals muscles contract & relax to bring movements					
	(II) Chemotropism.	1	5			
Section B (Chemistry)						
17.	(B) Pb	1	1			
18.	(D) Brown fumes	1	1			
19.	(C) Ketone	1	1			
20.	(A) Hydrophilic head and a hydrophobic tail.	1	1			
21.	(A) I and II	1	1			
22.	(D) C ₃ H ₄	1	1			
23.	(A) Natural indicator	1	1			
24.	(D) A is false but R is true.	1	1			
25.	(a)Acids do not produce H ⁺ ions in absence of water. / The separation of H ⁺ ion from acid molecule cannot occur in absence of water. (b) Acids present in curd form toxic salts with copper.	1 1	 2			
26.	(a) Combination reaction The beaker becomes hot because a large amount of heat is released during the reaction/ it is a highly exothermic reaction. (b) $\underset{\text{Quick lime}}{\text{CaO}} + \text{H}_2\text{O} \rightarrow \underset{\text{slaked lime}}{\text{Ca(OH)}_2} + \text{Heat}$	1 1 1	 3			
27.	A - C ₂ H ₅ OH/ Ethanol	½				

	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \quad \\ \text{H} \quad \text{H} \end{array}$ B - CH₃COOH /Ethanoic acid/ acetic acid $\begin{array}{c} \text{H} \quad \text{O} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \\ \text{H} \end{array}$ C- CH₃COOC₂H₅ /Ethyl ethanoate/ ethyl acetate/ester $\begin{array}{c} \text{H} \quad \text{O} \quad \quad \text{H} \quad \text{H} \\ \quad \quad \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \quad \\ \text{H} \quad \quad \quad \text{H} \quad \text{H} \end{array}$ Alternate answer $\text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{K}_2\text{Cr}_2\text{O}_7]{\text{Acidified}} \text{CH}_3\text{COOH}$ Ethanol (A) Ethanoic acid (B) $\text{A} + \text{B} \xrightarrow[\text{H}_2\text{SO}_4]{\text{conc}} \text{C} \quad (\text{CH}_3\text{COOC}_2\text{H}_5)$ Ester Ethyl ethanoate/ethyl acetate	½ ½ ½ ½ 1+1 1	
	OR (b) (i) Unsaturated hydrocarbons having double or triple bonds have a strong tendency to become saturated. / Unsaturated hydrocarbons are reactive and undergo addition reactions. (ii) Long chain of hydrocarbon in detergents does not form insoluble precipitate with Calcium or Magnesium ions of hard water and hence they remain effective even in hard water. (iii) Carbon is tetravalent. It can neither form C⁴⁺ cation nor C⁴⁻ anion. It completes its octet by sharing its valence electrons with other atoms of carbon or other elements forming covalent bonds.	1 1 1	3

28.	(a) • $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ / $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$ • Calcium sulphate hemihydrate (b) • Washing soda / Sodium carbonate • $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (c) (i) (I) Fixed number of water molecules present in one formula unit of salt. (II) $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$ OR (c) (ii) (I) Vanilla / Onion / Clove / Olfactory indicator (any other suitable example) (II) - In textile industry / paper industry as a bleaching agent. - as an oxidising agent in chemical industries - as a disinfectant (any one and any other)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 1	4
29.	(a) (i) (I) $2\text{HgS}(\text{s}) + 3\text{O}_2(\text{g}) \xrightarrow{\text{Heat}} 2\text{HgO}(\text{s}) + 2\text{SO}_2(\text{g})$ $2\text{HgO}(\text{s}) \xrightarrow{\text{Heat}} 2\text{Hg}(\text{l}) + \text{O}_2(\text{g})$ (II) $\text{ZnCO}_3(\text{s}) \xrightarrow{\text{Heat}} \text{ZnO}(\text{s}) + \text{CO}_2(\text{g})$ $\text{ZnO}(\text{s}) + \text{C}(\text{s}) \rightarrow \text{Zn}(\text{s}) + \text{CO}(\text{g})$ (III) At cathode $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$ At anode $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$ (ii) (I) Because movement of ions in solid state is not possible due to its rigid structure. (II) A large amount of heat energy is required to overcome strong electrostatic forces of attraction between oppositely charged ions in ionic compounds. OR b) (i)	1 1 1 1 1	

	• Cathode – Thin strip of pure zinc metal • Anode – Impure zinc metal	$\frac{1}{2}$ $\frac{1}{2}$	
	(ii) • A solution of Zinc salt like ZnSO_4. • On the cathode.	1 1	
	(iii) • Zinc forms a protective layer on iron preventing reaction of air and water with iron surface. • Galvanisation.	1 1	5
	Section – C (Physics)		
30.	D (i), (ii) and (iii)	1	1
31.	B (i) and (iii)	1	1
32.	(D) Assertion (A) is false but Reason (R) is true	1	1
33.	(a) $R_S = R_3 + R_4$ $R_S = 6 + 4 = 10\Omega$ $R_S \text{ and } R_2 \text{ are in parallel}$ $\frac{1}{R_p} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10} = \frac{1}{5}$ $R_p = 5\Omega$ $R_1 \text{ and } R_p \text{ are in series}$ $\text{Total Resistance} = 5 + 1 = 6\Omega$ $\text{Total Current } I = \frac{V}{R} = \frac{12}{6} = 2A$ OR (b) (i)  (ii) 	1 1 1	2
34.	• Diagram of pattern of magnetic field:		

	 - Factors : (i) Amount of current flowing in the circuit (ii) Distance from current carrying conductor	1	
35.	(a) Reasons: (i) the focal length of the eye lens is too long (ii) the eyeball has become too small. (b) (i) Hypermetropic eye  (ii) Correction 	$\frac{1}{2} + \frac{1}{2}$	
36.	- Fuse – It is used to protect the appliances from overloading (Short circuiting). - Green colour wire – Earth wire – Provides a low resistance conducting path for current to flow to the earth, if there is any leakage of current to metallic body of appliance, hence prevents from electric shock. - Fuse will not be able to protect the circuit during overloading	1	3

37.	Refraction of light by the earth's atmosphere due to variation in optical density of different layers of air is called as atmospheric refraction. (a) The starlight, on entering the earth's atmosphere undergoes refraction continuously in a medium of gradually increasing refractive index and we see the apparent position of the star. Since the physical conditions of atmosphere are not stationary, the apparent position of the star fluctuates and gives twinkling effect. (b) The air just above the fire becomes hotter than the air further up. The hotter air is lighter (less dens) than cooler air above it and has a refractive index slightly less than that of cooler air. Since the physical conditions of refracting medium are not stationary, the apparent position of objects, as seen through hot air fluctuates. And we see flickering objects.	1		
		1		
		1		3
38.	(a) Glass slab shows no dispersion because the colours dispersed by first refracting surface recombine and emerge out as white light at the second surface. In a glass prism different colours bend at different angles hence shows dispersion (b) Tiny water droplets act like prism. They refract and disperse the sunlight to show spectrum. (c) (i) With change in i, r will also change. Hence refractive index remains constant. $\text{Refractive index} = \frac{\text{speed of light in air}}{\text{speed of light in given medium}}$ Hence speed of light in that medium will also remain constant. OR (c) (ii) $n = \frac{\sin i}{\sin r}$ $n = \frac{\sin 60^\circ}{\sin 30^\circ} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$ $n = \frac{\text{speed of light in air}}{\text{speed of light in medium}}$ $\sqrt{3} = \frac{3 \times 10^8}{v}$ $v = \frac{3 \times 10^8}{\sqrt{3}}$ $v = \sqrt{3} \times 10^8 \text{ m/s}$	1		
		1		
		1		
		1		
		1/2		
		1/2		
		1/2		
		1/2		4

39.	(a) (i) 1 W is the power consumed by a device that carries 1A current when operated at a potential difference of 1V. / When 1J electrical energy is consumed in 1 s the power consumed is 1W. (ii) (I) Parallel combination $\frac{1}{R} = \frac{1}{1} + \frac{1}{2} = \frac{3}{2}$ $R = \frac{2}{3} \Omega$ $P = \frac{V^2}{R}$ $P = \frac{(12)^2}{2/3} = 216W$ (II) Series: $R = 1 + 2 = 3 \Omega$ $P = \frac{V^2}{R} = \frac{(12)^2}{3} = 48 W$ (iii) $R = \frac{V^2}{P}$ $R = \frac{(4)^2}{6} = \frac{8}{3} \Omega$ $P = VI$ $I = \frac{6}{4} = \frac{3}{2} A$ Since same current will flow in all resistors, hence $R_s = \frac{240}{3/2} = 160 \Omega$ $n = \frac{R_s}{R} = \frac{160}{8/3} = 60$ OR (b) (i) - Ohm's law: The potential difference, V, across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature remains the same. - According to Ohm's law $V \propto I$	1 1 1 1/2 1/2 1/2 1/2 1	

	It means that as the current through a wire increases, the potential difference across the wire increases linearly, hence the graph is a straight line. (ii) • Wire B • Slope of wire B is more $R = \frac{V}{I}$ Hence resistance of wire B is more. Since the dimensions of both wires are same therefore $R = \rho \frac{l}{A}$ Resistivity of wire B is more which is the characteristic of a heating element.	1 1 1 1	5
--	---	-------------------------------------	----------

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2026 (2nd Board Examination)
SUBJECT NAME : Science 086
(Q.P. CODE / Set No. 31/7/3)

General Instructions: -

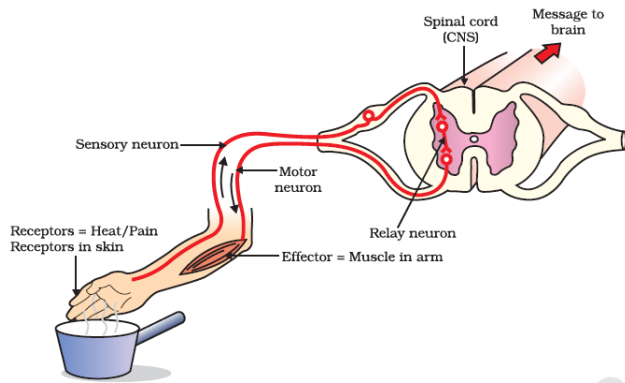
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. Its leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .

10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks 80 (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past :- • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “ Guidelines for Spot Evaluation ” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.
19	If a candidate attempts both alternatives/options in a question where only one option/alternative is required to be attempted, the Evaluator shall award marks in both the options. The system will take the higher of two scores and disregard the other response.
20	In a question having two options/alternatives, if a candidate has attempted only one, then the evaluator shall mark “NA” (Not attempted) against the option that has not been attempted by the candidate.

MARKING SCHEME
Science (Subject Code - 086)
(PAPER CODE : 31/7/3)

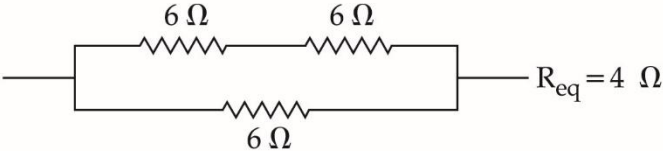
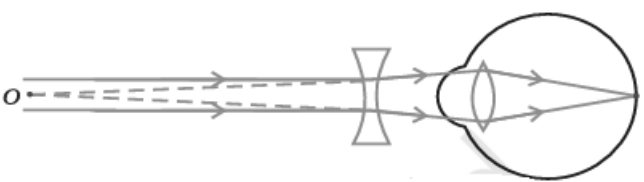
Q. No .	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
Section (A) Biology			
1.	(D) (ii) and (iv)	1	1
2.	(C) Rapid growth of part of the tendril away from the point of contact with the support.	1	1
3.	(C) 3 yellow : 1 green	1	1
4.	(C) it transports food to different parts of the plant body	1	1
5.	(C) Glomerulus	1	1
6.	(A) Pepsin.	1	1
7.	(C) Thyroxin	1	1
8.	(A) Both A and R are true and R is the correct explanation for A.	1	1
9.	(C) A is true but R is false.	1	1
10.	(i) (a) <i>Hydra</i> (b) <i>Bryophyllum</i> (ii) Asexual reproduction. (iii) New generation or new individuals can be created from a single parent / produces many offsprings in lesser time.	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
11.	(a) - Bacteria and fungi are decomposers that breakdown dead organisms or animal and plant wastes. If they are removed it will pollute the environment with dead remains, foul smell resulting in various diseases. - Also, the nutrients present in the plants will not be recycled back into the environment. OR (b) Only 10% of energy passes from one trophic level to the next. The loss of energy at each step is so great that very little usable energy remains after four trophic levels.	1 1 2	2
12.	a) - No. of chromosomes in Zygote : 48 - When the two gametes combine during sexual reproduction, it results in re-establishment of number of chromosomes. / - By fertilisation to form zygote	1 1	2

13.	(a) When waste is not segregated at source, it gets accumulated and materials like plastic will not be biodegraded. It may clog drains, pollute rivers and oceans and cause harm to cattle, fishes etc. (Or any other) (b) Because crop fields are manmade ecosystem and in this living organisms interact with each other and also with the abiotic components of the ecosystem. (c) These chemicals are non-biodegradable, hence keep getting accumulated at each trophic level, increasing progressively. As human beings occupy the top level in a food chain, the maximum concentration of these chemicals get accumulated in them. Phenomena is Biological magnification.	1 1 $\frac{1}{2}$ $\frac{1}{2}$	3
14.	(a) - Amount of water in the body - Amount of dissolved wastes that need to be excreted. (b) Plants use different methods for excretion - Some of their wastes are stored in dead tissues - Many plant waste products are stored in cellular vacuoles - Waste products may be stored in leaves that fall off - Other waste products like resins or gums are stored in old xylem (Any two points)	1 1 $\frac{1}{2} + \frac{1}{2}$	3
15.	(a) Deoxyribo nucleic acid (b) Meiosis / Reductional division where chromosome number becomes half. (c) India has variety of climatic conditions variations in wheat varieties will enable farmers to grow crop according to best suited variety in a particular climate. It will give benefit of survival and better grain quality. OR (d) A section of DNA provides information for one protein, is called gene for that protein. For example, plant height depends on hormones that trigger growth. Its quantity will be determined by efficiency of enzyme that is needed for the synthesis of this hormone. If the gene	1 1 2	

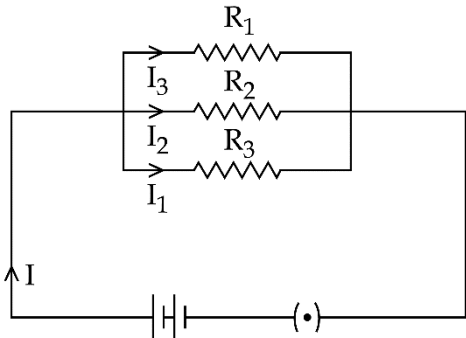
	has any variation, making it less efficient, it will make enzyme less efficient less hormone and hence short plant.	2	4				
16. A	(a) (i) Receptor → Sensory neuron → (CNS) Spinal cord ↓ Effector ← Motor neuron ← Relay neuron Alternate answer  Receptors = Heat/Pain Receptors in skin Sensory neuron Motor neuron Spinal cord (CNS) Relay neuron Effector = Muscle in arm Message to brain (ii) (I) Cerebrum / Fore brain (II) Cerebellum (III) Medulla in hindbrain OR (b) (i) 1) Electrical impulses reach only those cells which are connected by nervous tissue not each and every cell in the body. 2) Once an electrical impulse is generated in a cell and transmitted, the cell will take some time to reset its mechanism before it can generate and transmit a new impulse. (ii) (I) <table><tr><td>Movement in ‘Touch – me – not’ plant</td><td>Movement in animals</td></tr><tr><td>1. It uses electro – chemical means to convey the information of touch from cell</td><td>1. In animals there is specialised tissue muscles for movements which</td></tr></table>	Movement in ‘Touch – me – not’ plant	Movement in animals	1. It uses electro – chemical means to convey the information of touch from cell	1. In animals there is specialised tissue muscles for movements which	2 1 1 1 1+1 1	
Movement in ‘Touch – me – not’ plant	Movement in animals						
1. It uses electro – chemical means to convey the information of touch from cell	1. In animals there is specialised tissue muscles for movements which						

	to cell and there is no specialised tissue for this 2. Plant cells change shape due to changing amount of water resulting in swelling or shrinking	change shape due to special proteins. 2. In animals muscles contract & relax to bring movements	1	
	(II) Chemotropism.		1	5
	Section B (Chemistry)			
17.	(D) Caesium		1	
18.	(C) CaO		1	
19.	(A) Carboxylic acid		1	
20.	(C) C ₃ H ₆		1	
21.	(B) Synthetic indicator		1	
22.	(A) Hydrophilic head and hydrophobic tail		1	1
23.	(A) I and II		1	1
24.	(D) A is false but R is true.		1	1
25.	(a) Because distilled water does not contain ions whereas rain water has ions. (b) The process of addition of water to acid is highly exothermic which can cause acid to splash out and break the container.		1 1	2
26.	(a) A - C₂H₅OH/ Ethanol $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \quad \\ \text{H} \quad \text{H} \end{array}$ B - CH₃COOH /Ethanoic acid/ acetic acid $\begin{array}{c} \text{H} \quad \text{O} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{OH} \\ \\ \text{H} \end{array}$ C- CH₃COOC₂H₅ /Ethyl ethanoate/ ethyl acetate/ester $\begin{array}{c} \text{H} \quad \text{O} \quad \text{H} \quad \text{H} \\ \quad \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \\ \text{H} \quad \quad \text{H} \quad \text{H} \end{array}$		½ ½ ½ ½ ½	

	(c) (i) (I) Fixed number of water molecules present in one formula unit of salt. (II) $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$ OR (c) (ii) (I) Vanilla / Onion / Clove / Olfactory indicator (any other suitable example) (II) - In textile industry / paper industry as a bleaching agent. - as an oxidising agent in chemical industries - as a disinfectant (any one and any other)	1 1 1 1	4
29.	(a) (i) (I) $2\text{HgS(s)} + 3\text{O}_2\text{(g)} \xrightarrow{\text{Heat}} 2\text{HgO(s)} + 2\text{SO}_2\text{(g)}$ $2\text{HgO(s)} \xrightarrow{\text{Heat}} 2\text{Hg(l)} + \text{O}_2\text{(g)}$ (II) $\text{ZnCO}_3\text{(s)} \xrightarrow{\text{Heat}} \text{ZnO(s)} + \text{CO}_2\text{(g)}$ $\text{ZnO(s)} + \text{C(s)} \rightarrow \text{Zn(s)} + \text{CO(g)}$ (III) At cathode $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$ At anode $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$ (ii) (I) Because movement of ions in solid state is not possible due to its rigid structure. (II) A large amount of heat energy is required to overcome strong electrostatic forces of attraction between oppositely charged ions in ionic compounds. OR (b) (i) • Cathode – Thin strip of pure zinc metal • Anode – Impure zinc metal (ii) • A solution of Zinc salt like ZnSO_4. • On the cathode. (iii) • Zinc forms a protective layer on iron preventing reaction of air and water with iron surface.	1 1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1	

		1	2
35.	- Fuse – It is used to protect the appliances from overloading (Short circuiting). - Green colour wire – Earth wire – Provides a low resistance conducting path for current to flow to the earth, if there is any leakage of current to metallic body of appliance, hence prevents from electric shock. - Fuse will not be able to protect the circuit during overloading	1 1 1	3
36.	(a) Tyndall Effect :- The phenomenon of scattering of light by the colloidal particles which makes the path of light visible. This is called Tyndall effect. (b) Scattering of light depends on size of particles of colloid and wave length of colour of light while reflection of light is independent of both of them. (c) (i) Scatter the Short wavelength colours of sunlight (c) White light scattered	1 1 $\frac{1}{2}$ $\frac{1}{2}$	3
37.	- Reasons: (i) Excessive curvature of eye lens (ii) Elongation of eye ball (a) Myopic eye  (b) Correction 	$\frac{1}{2} + \frac{1}{2}$ 1 1	3

38.	(a) Glass slab shows no dispersion because the colours dispersed by first refracting surface recombine and emerge out as white light at the second surface. In a glass prism different colours of white light bend at different angles hence shows dispersion (b) Tiny water droplets act like prism. They refract and disperse the sunlight to show spectrum. (c) (i) With change in angle of incidence, angle of refraction will also change. Hence refractive index remains constant. Refractive index = $\frac{\text{speed of light in air}}{\text{speed of light in given medium}}$ Hence speed of light in that medium will also remain constant. OR (c) (ii) $n = \frac{\sin i}{\sin r}$ $n = \frac{\sin 60^\circ}{\sin 30^\circ} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$ $n = \frac{\text{speed of light in air}}{\text{speed of light in medium}}$ $\sqrt{3} = \frac{3 \times 10^8}{v}$ $v = \frac{3 \times 10^8}{\sqrt{3}}$ $v = \sqrt{3} \times 10^8 \text{ m/s}$	1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	4
-----	---	---	----------

39.	(a) (i) Resistance is opposition to the flow of electrons. /Property of a conductor due to which it retards the motion of electrons in an electric circuit. (ii) $V=IR$; $I = \frac{V}{R} = 500\text{mA}$ $R = \rho \frac{l}{A}$ $R_1 = \rho \frac{l_1}{A_1} \quad l_1 = 2l; A_1 = A/2$ $R_1 = \rho \frac{2l}{A/2} = 4R$ $I_1 = \frac{V}{R_1} = \frac{V}{4R} = \frac{500}{4} = 125 \text{ mA}$ (iii) • No change in resistivity. • It is the property of material only OR (b) (i) The potential difference 'V' across the ends of a given metallic wire in an electric circuit is directly proportional to current flowing through it, provides its temperature remains constant.  Current flowing through R_1, R_2 and R_3 is $I_1 = \frac{V}{R_1} \quad I_2 = \frac{V}{R_2} \quad I_3 = \frac{V}{R_3}$ If equivalent resistance is R_p then	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$	
-----	--	---	--

	$I = \frac{V}{R_p}$ $I = I_1 + I_2 + I_3$ $\frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$ $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ (iii) • Wire B • Reason: Slope of wire B is more $R = \frac{V}{I}$ Hence resistance of wire B is more. Since the dimensions of both wires are same therefore $R = \rho \frac{l}{A}$ Resistivity of wire B is more which is the characteristic of a heating element.	$\frac{1}{2}$ $\frac{1}{2}$ 1 1	5
--	--	---	---
