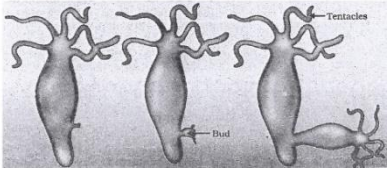General Instructions: -

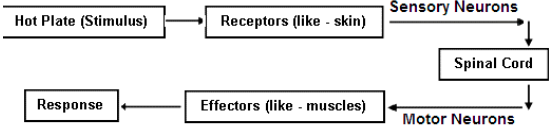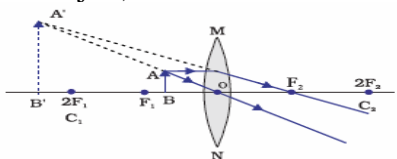|	
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC."
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after 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 0-80 (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.

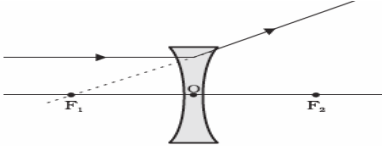|	
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions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

MARKING SCHEME
Secondary School Examination, 2024
SCIENCE (Subject Code–086)
[Paper Code: 31/4/1]

Maximum Marks: 80

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(B)/Displacement reaction	1	1
2	(D)/ HCl and NH_4OH	1	1
3	(D)/Hydrochloric acid and Sulphuric acid	1	1
4	(C)/Copper and Silver	1	1
5	(B)/9 and 3	1	1
6	(B)/ (i)Amino acid, (ii)glucose, (iii)fatty acid and glycerol	1	1
7	(C)/Abscisic acid	1	1
8	(A)/Sugarcane, roses, grapes	1	1
9	(A)/Cotyledon	1	1
10	(C)/46	1	1
11	(A)/$9/4 \times 10^{8}$ m/s	1	1
12	(C)/Blue	1	1
13	(C)/I and II	1	1
14	(A)/15000 J	1	1
15	(B)/move towards the side AB of the loop	1	1
16	(B)/(ii) and (iii)	1	1
17	(B) /Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A).	1	1
18	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)	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	(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A)	1	1
	SECTION B		

21	(a)
	(i) • HCl gas was evolved
	(ii) (I) No change in colour
	          (II) Wet blue litmus turns red
	     • HCl gas is acidic in nature
	
	OR
	
	(b) • $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_{2\,(g)}$
	
	(Any other example)
	     • Hydrogen burns with a pop sound when a burning matchstick is brought near it.
		½
		½
		½
		½
		
		1
		
		1
			2

22	<table><tr><td>saturated hydrocarbon</td><td>unsaturated hydrocarbon</td></tr><tr><td>Burns with clean blue flame/ Complete combustion</td><td>Burns with yellow flame with lots of black smoke. or Sooty flame / Incomplete combustion</td></tr></table> • Carbon dioxide; Water	½ +½ ½; ½	2

23	(a) When water is lost through stomata in the leaves by transpiration, it creates a suction force/transpiration pull. Due to which water is pulled up through xylem of the roots to the leaves. **OR** (b) • Heterotrophic /Holozoic Nutrition • Amoeba takes in food using temporary finger-like projections/pseudopodia of the cell which fuse over the food particle forming a food vacuole. Inside the food vacuole complex substances are broken down into simpler substances. / **(award marks if explained diagrammatically)**	2 1 1	 2
24	Example − A population of bacteria living in temperate waters that can withstand heat due to the rise in temperature due to global warming will survive better in a heat wave than the non-variant bacteria having no capacity to tolerate heat wave. Thus, suitable variations promote survival. **(Any other example)**	2	 2
25	• For distant vision: lens of power – 4·0 dioptre • f $(meter) = \frac{1}{P} = \frac{1}{-4\cdot 0D}$ = −0.25 m or -25 cm	1 1	 2
26	• Wire A will offer more resistance Justification: • $R \propto \dfrac{l}{A}$ /thinner the wire, more resistance to the flow of current.	1 1	 2
	SECTION C		
27	• Plaster of Paris; Calcium sulphate hemihydrate •Prepared from gypsum ($CaSO_4 \cdot 2H_2O$) by heating it at 373K $CaSO_4 \cdot \dfrac{1}{2} H_2O + 1\dfrac{1}{2} H_2O \longrightarrow CaSO_4 \cdot 2H_2O$	½ + ½ 1 1	 3
28	• Oxygen is added to ethanol to produce ethanoic acid. • Alkaline potassium permanganate or Acidified potassium dichromate $CH_3 - CH_2OH \xrightarrow[\text{Or acidified } K_2Cr_2O_7 + \text{Heat}]{\text{Alkaline } KMnO_4 + \text{Heat}} CH_3COOH$ • • It is oxidation reaction while other is combustion reaction/ burning of ethanol is exothermic while other is endothermic.	½ ½ 1 1	 3
29	(a) In hydra, a bud develops as an outgrowth due to repeated cell division at one specific site. These buds develop into tiny individuals and when fully mature, detach from the parent body and become new independent individuals. • Regenerative cells. **OR** (b) (i)Seminal vesicles and prostate glands: • Secrete a fluid for nourishment of sperms. • Secrete a fluid which makes the transport of the sperms easier (ii) Oviduct: • Egg is carried from ovary to the womb or uterus. • Site of Fertilization	1 1 ½ ½ ½ + ½ ½ + ½	

	(iii) Testis: • Produces sperms • Secretion of hormone – testosterone		½ + ½	3

30			

Dominant Traits	Recessive Traits
(i) When both dominant and recessive traits are inherited, the dominant trait gets expressed.	(i) When both dominant and recessive traits are inherited, the recessive trait does not get expressed.
(ii) A single copy of dominant trait is enough to get it expressed.	(ii) Both the copies of a trait should be recessive to get it expressed.

	1 x 2		
• 75% yellow seeds	1	3
31	•Ability of the eye lens to adjust its focal length. • Image distance remains unchanged •Ciliary muscles – • While focusing on distant objects ciliary muscles relax, eye lens becomes thin and its focal length increases.	1 1 ½ ½	3
32	(a) Because a magnetic field exists around the bar magnet (b) Strength of the magnetic field is maximum near the poles of the magnet (c) The lines represent the magnetic field lines (d) Equidistant parallel lines, magnetic field inside the solenoid is uniform	½ 1 ½ ½+½	3

33	(i) •Terrestrial /Grassland / cropland
	         •Aquatic /Pond
	 (ii)First trophic level are always producers or autotrophs as they can capture the solar energy and convert it into chemical energy.
	     • 1% energy is captured.
	 (iii)Because energy flows in one direction only.
	 Justification: when energy passes from one trophic level to other it cannot revert back.
		½
		 ½
		
		 ½
		 ½
		 ½
		 ½
			3

SECTION D

| 34 | (a) A chemical reaction involves the breaking and making of bonds between atoms to produce new substances. / when reactant changes to products.

 (i) Add lead nitrate solution to potassium iodide solution taken in a test tube. The colour changes from colourless solution to yellow ppt. /

 $$Pb(NO_3)_2 + 2KI \longrightarrow PbI_2\downarrow + 2KNO_3$$
 Yellow
 (Deduct ½ marks if colour is not mentioned in the reaction)
 (**or any example**)
 (ii) Calcium oxide reacts vigorously with water to produce slaked lime (calcium hydroxide) releasing a large amount of heat. /
 $$CaO(s) \quad + \quad H_2O(l) \rightarrow Ca(OH)_2(aq) \quad + \quad Heat$$
 (Quick lime)   (Slaked lime)

 (**or any example**)

 OR
 (b)
 (i) •A reactant breaks down to give two or more products. /A reaction which requires energy to split a compound or reactant in two or more simple substances. | 1

 1+1

 1+1

 1 | |

	(I) Water splits into hydrogen gas and oxygen gas.	½	
	• Electrical energy	½	
	(II) Silver bromide decomposes into silver and bromine	½	
	• Light energy	½	
	(ii)		
	(I) Formation of calcium oxide:		
	$$CaCO_3(s) \xrightarrow{\text{Heat}} CaO(s) + CO_2(g)$$	½	
		½	
	• It is an endothermic reaction/decomposition reaction.		
	(II) Formation of calcium hydroxide:		
	$$CaO + H_2O \longrightarrow Ca(OH)_2 + \text{Heat}$$	½	
	• It is exothermic/combination reaction	½	5

35	(a)		
	(i) • The pathway in which impulses travel during the reflex action is called a reflex arc.	1	
	• Because the thinking part of the brain is not fast enough/for quick response to avoid injury.	½	
	• Reflex arc :		
		1+½	
	(ii) Peripheral Nervous System	1	
	Components : Cranial Nerves; Spinal Nerves	½; ½	
	OR		
	(b)		
	(i) •Touch	½	
	• The shape of the leaves changes by changing the amount of water in them.	1	
	• No	½	
	(ii) Growth of a part of plant in response to the pull of earth or gravity is called geotropism.	1	
	• Positive geotropism − Movement of plant part towards the earth gravity. Example − Roots grow downwards	½+½	
	• Negative geotropism − Movement of plant part away from the force of gravity. Example − Shoots grow upwards.	½+½	5

36	(a)		
	(i) S. No. 3, 2f is 50 cm. ∴ 2f = 50 cm, or f = 25 cm.	1	
	Justification: Object distance(u) and image distance (v) are same so it implies that object is placed at 2F.	1	
	(ii) S. No. 6, is not correct.	½	
	Reason: For u = −15 cm, sign of v **must** be – ve (as the image is formed on the same side of the lens as the object)	½	
		1	

	(deduct ½ mark if the direction of the rays are not shown)			
	(iii) Magnification : $m = \dfrac{v}{u}$			
	$$= \frac{+\,150\ cm}{-\,30\ cm} = -5\ cm$$	1		
	OR			
	(b)			
	(i) Principal axis : It is an imaginary line passing through the two centres of curvatures of a lens.	1		
		1		
	(ii) f $= -20$ cm; h $= 5$ cm; v $= -15$ cm	½		
	$\dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{f}$ *or*	½		
	$$\frac{1}{u} = \frac{1}{v} - \frac{1}{f} = \frac{1}{(-15)} - \frac{1}{(-20)}$$			
	$$= \frac{-1}{60\ cm}$$	1		
	or $u = -60$ cm object is at a distance of 60 cm from the lens			
	• Size of the image(magnification): m $= \dfrac{h'}{h} = \dfrac{v}{u}$			
	$h' = \dfrac{v}{u} \times h = \dfrac{(-15)}{(-60)} \times 5 = 1{\cdot}25$ cm	1	5	
	SECTION E			
37	(a) In the test tube containing magnesium.	1		
	(b) All three metals react with HCl because they are more reactive than hydrogen**.**	1		
	(Award marks if student write any less reactive metal with reason)			
	(c) (i)Because HNO_3 is a strong oxidizing agent and oxidizes the H_2 produced to water.	1		
	• Ultimate products are water, oxides of nitrogen.	1		
	OR			
	(c)			
	(ii) • Displacement Reaction	1		
	• If metal X displaces metal Y from its salt solution it is more reactive than Y or vice versa.	1	4	
38	(a) (i) Renal Artery	½		
	(ii) Glomerulus	½		
	(b) • Urinary bladder	½		
	• Nervous control	½		
	(c) (i) Filtration: Nitrogenous wastes such as urea or uric acid are removed	½+½		
	Reabsorption: Glucose, amino acids, salts/some useful materials and major amounts of water reabsorbed	½+½		
	OR			

	(c) (ii)Tubular part of nephron.		1	
	• The amount of water absorbed depends on:			
	-how much water is there in the body.		½	
	-how much dissolved waste is there to be excreted.		½	4
39	(a) $R_S = 4\,\Omega + 6\,\Omega + 16\,\Omega = 26\,\Omega$		1	
	(b) $\dfrac{1}{R_P} = \dfrac{1}{8\,\Omega} + \dfrac{1}{8\,\Omega} = \dfrac{1}{4}\,\Omega$			
	$R_p = 4\,\Omega$		1	
	(c) (i) Total resistance $= 26\,\Omega + 4\,\Omega = 30\,\Omega$		1	
	Potential difference $= V = 6V$			
	Current $I = \dfrac{V}{R}$		½	
	$\dfrac{6}{30} = \dfrac{1}{5}\ A$ or 0·2 A.		½	
	OR			
	(c)(ii) $16\,\Omega$			
			1	
	Justification: According to Ohm's law when same current flows, the potential difference across a higher resistance is always higher./			
	Potential difference across $16\,\Omega$ =V=IR = 0.2x16=3.2V			4
	Potential difference across $8\,\Omega$ =V=IR$_{(total)}$ = 0.2x4 =0.8V		1	