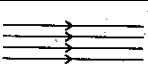
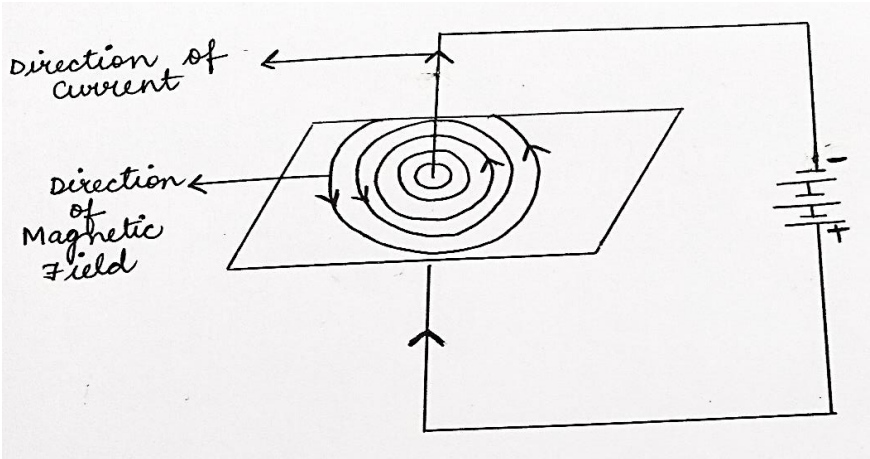


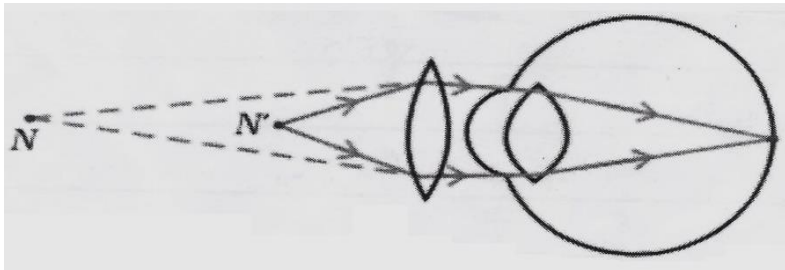
MARKING SCHEME
Secondary School Examination, 2024
SCIENCE (Subject Code–086)
[Paper Code: 31/1/3]

Maximum Marks: 80

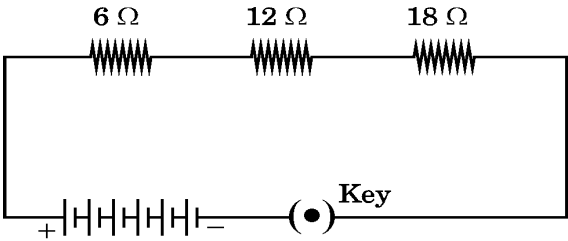
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
SECTION A			
1	(c) / $2 \text{AgBr} \longrightarrow 2 \text{Ag} + \text{Br}_2$	1	1
2	(b) / $2 \text{NaOH} + \text{Zn} \longrightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$	1	1
3	(d) / MnO_2 is reduced and HCl is oxidised	1	1
4	(d) / Na_2CO_3	1	1
5	(c) / Neuromuscular junction	1	1
6	(c) / Mercury and Bromine	1	1
7	(c) / At twice the focal length of the lens	1	1
8	(c) / (ii) and (iv)	1	1
9	(c) / amphoteric	1	1
10	(d) / (i) and (iv)	1	1
11	(b) / (ii) and (iv)	1	1
12	(c) / Vas deferens	1	1
13	(d) / Plasmodium	1	1
14	(d) / The upper portion is of concave lens for the distant vision and lower part is of convex lens for the near vision.	1	1
15	(a) / 	1	1
16	(c) / Tiger, grass, snake, frog	1	1
17	(c) / Assertion (A) is true, but Reason (R) is false.	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	(b) / Both Assertion (A) and Reason (R) are true, but Reason (R) is <i>not</i> the correct explanation of Assertion (A).	1	1
20	(c) / Assertion (A) is true, but Reason (R) is false.	1	1
SECTION-B			
21	(A) (i) The communication between the central nervous system and the other parts of the body is facilitated by the peripheral nervous systems. (ii) protected in a bony box/skull//cranium/fluid filled balloon like structure which provides shock absorption.	1 1	
OR			

	<p>(B) Chemotropism ; eg. growth of pollen tubes towards the ovules.</p> <p>Hydrotropism ; eg. growth of roots towards water.</p>	<p>1/2 1/2 1/2 1/2</p>	2						
22	<p>(i) Herbivores eating grass need a longer small intestine to allow the cellulose to be digested. Meat is easier to digest. Hence carnivores have shorter small intestine.</p> <p>(ii)</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">Pepsin</th> <th style="text-align: center;">Trypsin</th> </tr> </thead> <tbody> <tr> <td>i. Secreted by the gastric glands present in the walls of stomach</td> <td>Secreted in pancreas</td> </tr> <tr> <td>ii. Acts in acidic medium</td> <td>Acts in alkaline medium</td> </tr> </tbody> </table> <p style="text-align: right;">(Any one)</p>	Pepsin	Trypsin	i. Secreted by the gastric glands present in the walls of stomach	Secreted in pancreas	ii. Acts in acidic medium	Acts in alkaline medium	<p>1 1</p>	2
Pepsin	Trypsin								
i. Secreted by the gastric glands present in the walls of stomach	Secreted in pancreas								
ii. Acts in acidic medium	Acts in alkaline medium								
23	<p style="text-align: center;">$2 BaCl_2(aq) + Al_2(SO_4)_3(aq) \rightarrow 2 AlCl_3(aq) + 3 BaSO_4(s)$</p> <p>It is a precipitation reaction because insoluble BaSO₄ is formed and gets precipitated / double displacement reaction because in this exchange of ions takes place between the reactants.</p> <p style="text-align: right;">Name of the chemical reaction Reason</p>	<p>1 1/2 1/2</p>	2						
24	<p>(i) If they intersect then at the point of intersection, there would be two directions of magnetic field or compass needle would point towards two directions, which is not possible.</p> <p>(ii) Uniform magnetic field is represented by equidistant parallel straight lines</p> <div style="text-align: center;"> </div>	<p>1 1/2 1/2</p>	2						

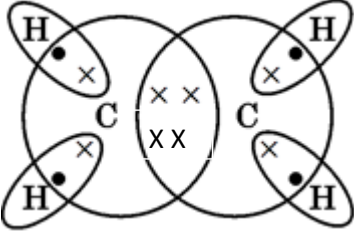
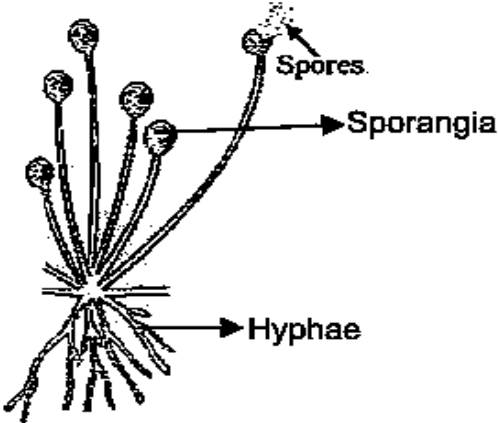
25	 <p style="text-align: right;">Direction of current Direction of Magnetic Field Lines</p>	1 1/2 1/2	2
26	<p>$u = -10\text{ cm}; f = +15\text{ cm}$</p> $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{15} = \frac{1}{v} + \frac{1}{-10\text{ cm}}$ $\frac{1}{v} = \frac{1}{15\text{ cm}} + \frac{1}{10\text{ cm}}$ $v = +6\text{ cm}$ <p>Image is formed behind the mirror.</p>	1/2 1/2 1	2
SECTION-C			
27	<p>(A)</p> <ul style="list-style-type: none"> • Number of plants/organisms of first trophic level will increase. • Number of lions/ third trophic level will decrease. <p>• No</p> <p>• As the organisms of that level will find alternative foods and will not starve to death / food web is more stable where other animals as prey may be available.</p> <p style="text-align: center;">OR</p> <p>(B)</p> <ul style="list-style-type: none"> • Gas 'X' is Ozone • Ozone shields the surface of the earth from ultra-violet (UV) radiations from the sun. • CFCs (Chlorofluorocarbons) 	1 1 1/2 1/2 1 1 1/2	

	<ul style="list-style-type: none"> Succeeded in forging an agreement to freeze CFC production at 1986 levels / Manufacturing of CFC free refrigerators 	1/2	3
28	<p>(i)</p> <ul style="list-style-type: none"> Right - Hand Thumb Rule If the wire carrying current is held in our right hand such that the Thumb points towards the Direction of Current, then the fingers wrap around the conductor in the direction of field lines of the magnetic field. <p>(ii)</p> <ul style="list-style-type: none"> Fleming's Left - Hand Rule Stretch the thumb, forefinger and middle finger of left hand mutually perpendicular to each other, such that first finger points in the direction of Magnetic Field, second finger in the direction of Current, then thumb in the direction of motion or force acting on the conductor. 	1/2 1 1/2 1	3
29	<p>(i) Hypermetropia or Far-sightedness. Reason – Image is formed behind the retina. / Near point for the person is farther away from the normal near point (25 cm)</p> <p>(ii)</p> <ul style="list-style-type: none"> Focal length of the eye lens is too long. The eyeball has become too small. <p>(iii)</p>  <p>N = Near point of a hypermetropic eye N' = Near point of a normal eye</p>	1/2 1/2 1/2 1/2 1	3
30	<p>Reflex action is a sudden/spontaneous/immediate action in response to the environment/stimulus e.g. sneezing.</p> <p style="text-align: center;"> Stimulus → Receptors (Nose) → Sensory neuron → Spinal cord (Relay neuron) → Motor neuron → Effector (Muscles) → Response </p> <p style="text-align: right;">(any other example)</p>	1 2	3
31	(i)Amphibians - frogs / Reptiles - lizards	1/2	

	<ul style="list-style-type: none"> The body temperature depends on the temperature in the environment. Therefore they can tolerate some mixing of the oxygenated and de-oxygenated blood streams. <p>(ii) Two functions:</p> <ul style="list-style-type: none"> Lymph carries digested and absorbed fat from intestine Drains excess fluid from extra cellular space back into the blood. 	<p>½</p> <p>1</p> <p>1</p>	3
32	<p>(i) Plaster of Paris ; Calcium Sulphate hemihydrate</p> <p>(ii)</p> $CaSO_4 \cdot 2 H_2O \xrightarrow{373 K} CaSO_4 \cdot \frac{1}{2} H_2O + 1 \frac{1}{2} H_2O$ <p>(iii) Two uses :</p> <ul style="list-style-type: none"> Used for making toys Materials for decoration Making surfaces smooth Supporting fractured bones <p style="text-align: right;">(Any two) (Any other alternate answer)</p>	<p>½ + ½</p> <p>1</p> <p>½ + ½</p>	3
33	<p>(i) A reaction in which a single substance on absorption of energy decomposes to give two or more substances.</p> $2 Pb(NO_3)_2 \xrightarrow{Heat} 2 PbO + 4 NO_2 + O_2$ <p>(ii) Cathode : Anode (Mass ratio) 1 : 8</p>	<p>1</p> <p>1</p> <p>1</p>	3
SECTION-D			
34	<p>(A)(i)(a) same current and same potential difference. (b) same current and same potential difference (c) same current but different potential difference (d) different current but same potential difference.</p> <p>(ii) (a) Minimum resistance – When resistors are in parallel</p> $\frac{1}{R} = \frac{1}{24} + \frac{1}{24}$	<p>½ x4</p> <p>½</p>	

	$\therefore R_p = 12 \Omega$ $\text{Power consumed } P_1 = \frac{V^2}{R_p} = \frac{6V \times 6V}{12 \Omega} = 3W$ <p>(b)</p> $\therefore R_s = 24 \Omega + 24 \Omega = 48 \Omega$ $\text{Power consumed } P_2 = \frac{V^2}{R_s} = \frac{6V \times 6V}{48 \Omega} = \frac{3}{4}W$ <p style="text-align: center;"><i>from P₁ and P₂</i></p> $\therefore \frac{P_1}{P_2} = \frac{\frac{3}{4}}{\frac{3}{4}} = \frac{4}{1}$ $\Rightarrow P_p : P_s = 4 : 1$ <p style="text-align: center;">OR</p> <p>(B)</p>  <p style="text-align: center;">12 V (Six cells of 2 V each)</p> <p>(i) Current = $\frac{V}{R} = \frac{12}{(6+12+18) \Omega} = \frac{1}{3} A$</p> <p>(ii) Potential difference across 18 Ω resistor = $I \times R = \frac{1}{3} A \times 18 \Omega = 6 V$</p> <p>(iii) Power consumed in 18 Ω resistor = $V \times I = 6 V \times \frac{1}{3} A = 2 W$</p>	<p>1/2</p> <p>1/2</p> <p>1/2</p> <p>1/2</p> <p>1/2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	5
35	(A)		

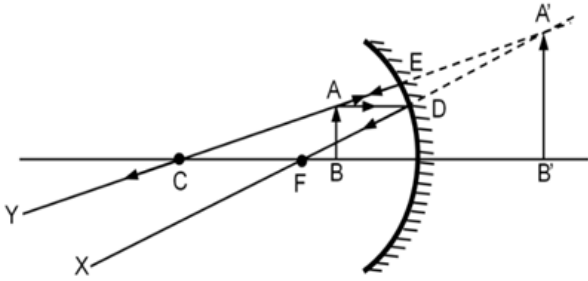
	<p>(i) A series of carbon compounds in which the same functional group substitutes for hydrogen in a carbon chain / Series of compounds having same functional group and similar chemical properties.</p>	1	
	(ii) Because melting point and boiling point increase with molecular mass.	1	
	(iii) Because chemical properties of organic compounds are solely determined by their functional group which remains same in a homologous series.	1	
	(iv)		
	(i) Aldehyde: Propanal	½	
	$\begin{array}{c} \text{H} \quad \text{O} \\ \quad \\ \text{H}_3\text{C} - \text{C} - \text{C} - \text{H} \\ \\ \text{H} \end{array} \quad / \text{CH}_3\text{CH}_2\text{CHO}$	½	
	(ii) Ketone: Propanone	½	
	$\text{H}_3\text{C} - \text{C} - \text{CH}_3 \quad / \text{CH}_3\text{COCH}_3$ $\quad $ $\quad \text{O}$	½	
	OR		
	(B)		
	(i) Ethanol Structure:	½	
	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H} - \text{C} - \text{C} - \text{OH} \\ \quad \\ \text{H} \quad \text{H} \end{array} \quad / \text{C}_2\text{H}_5\text{OH} \quad / \text{CH}_3\text{CH}_2\text{OH}$	1	
	(ii) Ethene is formed	½	
	$\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Conc.H}_2\text{SO}_4, 443\text{K (Heat)}} \text{H}_2\text{C} = \text{CH}_2 + \text{H}_2\text{O}$ <p style="text-align: center;"><i>Ethanol</i> <i>Ethene</i> <i>Water</i></p>	1	
	[Note: Deduct ½ marks if the conditions required are not mentioned in the equation]		
	<ul style="list-style-type: none"> Concentrated Sulphuric acid acts as a dehydrating agent. 	½	

	<p>(iii) Ethene</p> 	<p>1/2</p> <p>1</p>	<p>5</p>
<p>36</p>	<p>(A) (i)</p> <ul style="list-style-type: none"> • Chemical Method/Oral pills Side effects: Change the hormonal balance of the body. • Barrier method / Loop / Copper-T Side effects: Irritation in uterus. • Surgical method / Fallopian tube in female is blocked; Side effects – may cause infections. <p>(ii)</p> <p>(a) Fertilized egg/zygote gets implanted in the lining of uterus and starts dividing.</p> <p>(b) If the egg is not fertilized, the thick and spongy lining of the uterus breaks and comes out through the vagina as blood and mucous.</p> <p style="text-align: center;">OR</p> <p>(B) (i)</p>  <p>(a) Reproductive part – Sporangia</p> <p>(b) Non-reproductive part – Hypha/Hyphae.</p>	<p>1/2</p> <p>1/2</p> <p>1/2</p> <p>1/2</p> <p>1</p> <p>1</p> <p>1</p> <p>1/2</p> <p>1/2</p>	

	<ul style="list-style-type: none"> Dry slice of bread does not provide moisture and nutrients necessary for the germination and multiplication of Rhizopus. 	1	
(ii)	<ul style="list-style-type: none"> Budding: Hydra uses regenerative cells for reproduction. A bud develops as an outgrowth due to repeated cell division at one specific site and develop into tiny individuals. On maturation, these buds detach from the parent and become new individuals. <p>Alternate answer:</p> <ul style="list-style-type: none"> Regeneration: It is carried out by specialised cells. If hydra is cut or broken into many pieces, many of these pieces grow into separate individuals. <p>[Note: Award marks for either of the processes and its explanation]</p>	1 1	
			5

SECTION E

37	<p>(i)</p> <ul style="list-style-type: none"> In F₁ generation, all plants were tall / No short plants were observed No medium height plants / No halfway characteristics were observed / Only dominant parental traits were seen and not the mixture of the two. <p>(ii)</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Dominant trait</th> <th>Recessive trait</th> </tr> </thead> <tbody> <tr> <td>Single copy of dominant trait is enough to get it expressed/always expressed</td> <td>Only expressed when present in pair.</td> </tr> </tbody> </table> <p align="right">(Any other point)</p> <p>(iii) (A)</p> <ul style="list-style-type: none"> Self-pollination / Self-fertilisation/Selfing of F₁ plants Ratio – Round Yellow : Wrinkled Green 9 : 1 Traits are inherited independently. <p align="center">OR</p> <p>(iii) (B) If pea plants with yellow seeds are crossed with plants of green seeds, it is found that in F₁ generation all the plants have yellow seeds. When F₁</p>	Dominant trait	Recessive trait	Single copy of dominant trait is enough to get it expressed/always expressed	Only expressed when present in pair.	<p>½</p> <p>½</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p>	
Dominant trait	Recessive trait						
Single copy of dominant trait is enough to get it expressed/always expressed	Only expressed when present in pair.						

	<p>plants are self-pollinated, it is found that in F₂ generation, plants with yellow seeds and plants with green seeds are obtained. This shows that both the traits are inherited but only one trait is visible in F₁ progeny while the other remains unexpressed.</p> <p>[Note: Award marks if explained by taking one characteristic / Or explained the same diagrammatically]</p>	2	4
38	<p>(i)</p> <ul style="list-style-type: none"> • Mirror A. • as the object is placed beyond the centre of curvature of the mirror. <p>(ii) Same size/ Real / Inverted (Any two)</p> <p>(iii) (A) Nature-Virtual and erect Size-magnified</p>  <p>(Deduct ½ mark if direction of rays are not marked)</p> <p>OR</p> <p>(iii) (B) Here $f = -12$ cm, $u = -18$ cm, $v = ?$</p> <p>Mirror formula $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$</p> $\frac{1}{v} = \frac{1}{-12} - \frac{1}{-18}$ $v = -36\text{cm}$ <p>In front of the mirror at a distance of 36 cm from the pole of the mirror.</p>	<p>½ ½</p> <p>½ + ½</p> <p>½ ½</p> <p>1</p> <p>½ ½</p> <p>1</p>	4
39	<p>(i) Cathode – Pure copper</p> <p>Anode – Impure copper</p>	<p>½</p> <p>½</p>	

	<p>(ii) Acidified Copper Sulphate; CuSO_4</p> <p>(iii) (A)</p> <ul style="list-style-type: none"> Pure copper from the anode dissolves into electrolyte and an equivalent amount of pure metal from the electrolyte is deposited on cathode / <p style="text-align: center;">At anode : $\text{Cu} \longrightarrow \text{Cu}^{++} + 2\text{e}^-$</p> <p style="text-align: center;">At cathode : $\text{Cu}^{++} + 2\text{e}^- \longrightarrow \text{Cu}$ Pure</p> <ul style="list-style-type: none"> The soluble impurities go into the solution whereas insoluble impurities settle down at the bottom of the anode. <p>[Note: Award marks if explained with a suitable labelled diagram]</p> <p style="text-align: center;">OR</p> <p>(iii) (B)</p> <p>In Beaker A : • The blue colour of the solution fades (or becomes colourless)</p> <ul style="list-style-type: none"> Reason – Zn is more reactive than copper <p>In Beaker B: • No change in colour.</p> <ul style="list-style-type: none"> Reason – Silver is less reactive than Copper 	<p>$\frac{1}{2} + \frac{1}{2}$</p> <p>1</p> <p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>	<p>4</p>
--	--	---	----------
