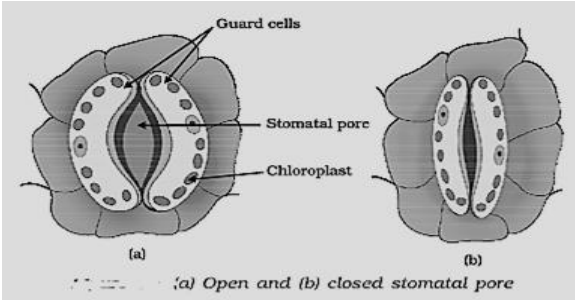
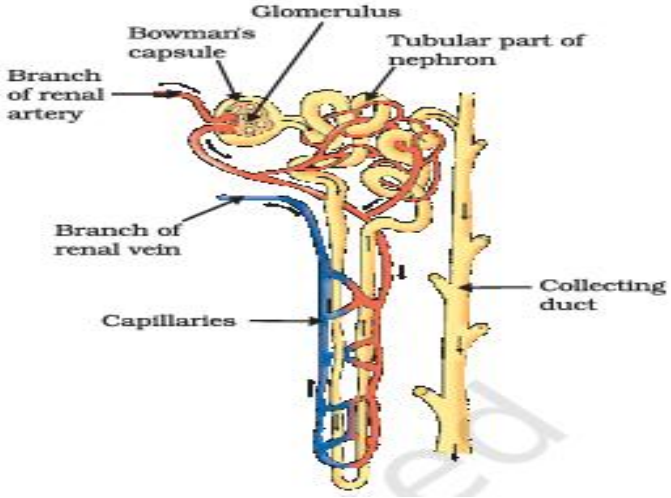


MARKING SCHEME
SCIENCE (Subject Code-086)
(PAPER CODE: 31/4/1) (10-04-86K)

Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total Marks
	SECTION – A BIOLOGY		
1.	(C) / By breaking down the nutrients of bread outside the body and then absorbing them.	1	1
2.	(C) / Formation of fruit.	1	1
3.	(B) / (iv)	1	1
4.	(B) / (i) and (iv)	1	1
5.	(A) / (i), (ii) and (iii)	1	1
6.	(B) / (i) and (iv)	1	1
7.	(D) / Contraction of Left Ventricle.	1	1
8.	(C) / Assertion (A) is true but Reason (R) is false.	1	1
9.	(A) / Both Assertion(A) and Reason(R) are true, and Reason (R) is correct explanation of Assertion(A).	1	1
10.	<ul style="list-style-type: none"> Necessary- It helps in transport of water and minerals from roots to leaves/ helps in temperature regulation. Evil- It results in loss of water. 	1 1	2
11.	<ul style="list-style-type: none"> Only 10% of the energy from one trophic level is transferred to the next level. Most of the energy is lost as heat. So very little usable energy will remain after four trophic levels./ <div style="text-align: center;"> $\begin{array}{ccccc} \text{Grass} & \xrightarrow{10\%} & \text{Grasshoper} & \xrightarrow{10\%} & \text{Frog} \\ \text{(Producer)} & & \text{(Primary} & & \text{Secondary} \\ \text{1000k Cal.)} & & \text{consumer} & & \text{consumer} \\ & & \text{100k Cal.)} & & \text{10k Cal.)} \end{array}$ <p>(Any other suitable food chain)</p> </div>	1 1	2
12	<p>(A)</p> <ul style="list-style-type: none"> As his pancreatic duct is blocked, enzymes for digestion will not be transported to small intestine / The blockage will cause difficulty in digestion of proteins, carbohydrates and fats. Insulin secretion is already affected. <p style="text-align: center;">OR</p> <p>(B)</p> <ul style="list-style-type: none"> Reflex action An automatic and quick response to a stimulus which does not involve thinking. 	1 1 ½ ½	

	<ul style="list-style-type: none"> Stimulus → Receptor → sensory neuron → relay neuron (spinal cord) → Motor neuron → effector (muscle) response. 	1	2
13.	<p>(a) Because adrenal gland secretes adrenaline hormone that enables the animal body to face a scary situation.</p> <p>(b) To prevent female foeticide.</p> <p>(c) Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds / Such methods also make possible the propagation of plants such as banana, orange, rose and jasmine that have lost the capacity to produce seeds / All plants produced are genetically similar enough to the parent plant to have all its characteristics.</p>	1 1 1	3
14.	<p>(a) Parents : $RR \times rr$ (Red flowers) (White flowers)</p> <p>Gametes : $\textcircled{R} \quad \textcircled{r}$</p> <p>F₁: Rr (All red)</p> <p>$Rr \times Rr$</p> <p>Gametes: $\textcircled{R} \quad \textcircled{r} \quad \textcircled{R} \quad \textcircled{r}$</p> <p>F₂</p> <p>Phenotypic ratio/ Showing external look of plants : 33 : 11 3 : 1 (Red) (White)</p> <p>Genotypic Ratio : 1 : 2 : 1 RR : Rr : rr</p>	1/2 1/2 1/2 1/2	3
15.	<p>(a) Due to hydrotropism, the roots grow towards area of water availability so that they can absorb water and minerals.</p> <p>(b) Auxins promote cell elongation / Auxin regulates the tropic responses like bending (growth) of stem towards light.</p>	1 1	

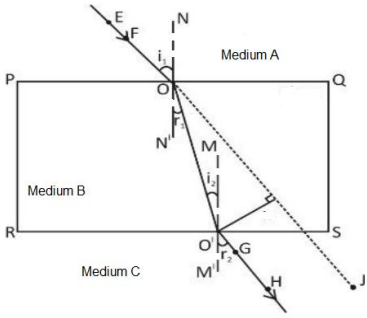
	<p>(c)</p> <table border="1" data-bbox="391 205 1263 401"> <thead> <tr> <th>Movement by sensitive plants</th> <th>Tropic Movements by plants</th> </tr> </thead> <tbody> <tr> <td>Non-directional</td> <td>Directional</td> </tr> <tr> <td>Fast</td> <td>Slow</td> </tr> <tr> <td>Growth independent movement</td> <td>Growth related</td> </tr> </tbody> </table> <p>(Any two points, any other difference) OR</p> <p>(c)</p> <table border="1" data-bbox="315 541 1297 737"> <thead> <tr> <th>Movement of Roots</th> <th>Movement of Shoots</th> </tr> </thead> <tbody> <tr> <td>Gravity: Grows towards gravity / Positive geotropism</td> <td>Gravity: Grows away from gravity / Negative geotropism</td> </tr> <tr> <td>Light: Grows away from light / Negative phototropism</td> <td>Light: Grows towards light/ Positive phototropism</td> </tr> </tbody> </table>	Movement by sensitive plants	Tropic Movements by plants	Non-directional	Directional	Fast	Slow	Growth independent movement	Growth related	Movement of Roots	Movement of Shoots	Gravity: Grows towards gravity / Positive geotropism	Gravity: Grows away from gravity / Negative geotropism	Light: Grows away from light / Negative phototropism	Light: Grows towards light/ Positive phototropism	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>4</p>
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<p>16.</p>	<p>(A)</p> <p>(a)</p>  <p>(b)</p> <ul style="list-style-type: none"> • Absorption of light energy by chlorophyll. • Conversion of light energy to chemical energy and splitting of water molecule into hydrogen and oxygen. • Reduction of carbon dioxide to carbohydrates. <p>(c)</p> $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ <p style="text-align: center;">(Glucose)</p> <p style="text-align: center;">OR</p>	<p>1 + 1</p> <p>2</p> <p>1</p>															

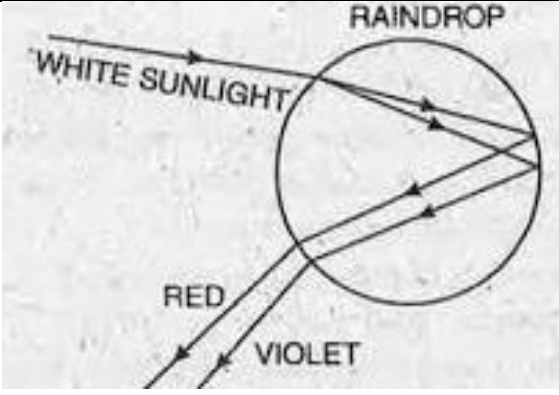
	<p>(B) (a)</p>  <p style="text-align: right;">Diagram Labelling of any 4 parts</p> <p>(b) Filtration of blood to remove wastes. (c) It is a process by which useful substances like glucose, amino acids, vitamins, salts and most of water are reabsorbed from filtrate, back into the blood.</p>	<p>1 ½ x 4</p> <p>1</p> <p>1</p>	<p>5</p>
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SECTION – B
Chemistry

17.	(B)/ 2 : 1	1	1
18.	(C)/ Exothermic Reaction	1	1
19.	(B)/ Hydrochloric acid	1	1
20.	(A)/ The hydrophobic tail of the soap molecule is in the interior of the cluster, whereas hydrophilic end is on the surface of the cluster.	1	1
21.	(D)/ Magnesium	1	1
22.	(D)/ Steel	1	1
23.	(A)/ By adding acid to water with constant stirring.	1	1
24.	(A)/ Both A and R is true and R is correct explanation of A.	1	1
25.	(a) A → Sodium hydrogen carbonate/ baking soda/ NaHCO ₃ B → Sodium carbonate/ washing soda/ Na ₂ CO ₃	½ ½	

	(b) <ul style="list-style-type: none"> • $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ • 373K / 100°C 	$\frac{1}{2}$ $\frac{1}{2}$	2
26.	(a) Decomposition of silver chloride (AgCl) to form silver (Ag) $2\text{AgCl(s)} \xrightarrow{\text{Sunlight}} 2\text{Ag(s)} + \text{Cl}_2\text{(g)}$	1	
	(b) Decomposition of lead nitrate releases NO_2 / Nitrogen dioxide $2\text{Pb(NO}_3)_2\text{(s)} \xrightarrow{\text{Heat}} 2\text{PbO(s)} + 4\text{NO}_2\text{(g)} + \text{O}_2\text{(g)}$ <p style="text-align: center;"> <small>(Lead nitrate) (Lead oxide) (Nitrogen dioxide) (Oxygen dioxide)</small> </p>	1	
	(c) To prevent the oxidation of fats in food items.	1	3
27.	(A) <p>(i) (a) Carbonate ore: Calcination $\text{ZnCO}_3\text{(s)} \xrightarrow{\text{Heat}} \text{ZnO(s)} + \text{CO}_2\text{(g)}$ </p> <p>(b) Sulphide ore : Roasting $2\text{ZnS(s)} + 3\text{O}_2\text{(g)} \xrightarrow{\text{Heat}} 2\text{ZnO(s)} + 2\text{SO}_2\text{(g)}$ </p>	$\frac{1}{2}$ $\frac{1}{2}$	
	(ii) $\text{Fe}_2\text{O}_3\text{(s)} + 2\text{Al(s)} \rightarrow 2\text{Fe(l)} + \text{Al}_2\text{O}_3\text{(s)} + \text{Heat}$	1	
	(iii) <ul style="list-style-type: none"> • Anode: Impure copper rod. • Cathode: Pure copper strip. <p style="text-align: center;">OR</p>	$\frac{1}{2}$ $\frac{1}{2}$	
	(B) <p>(i) $2\text{ZnS(s)} + 3\text{O}_2\text{(g)} \xrightarrow{\text{Heat}} 2\text{ZnO(s)} + 2\text{SO}_2\text{(g)}$ $\text{ZnO(s)} + \text{C(s)} \rightarrow \text{Zn(s)} + \text{CO(g)}$ </p>	1 1	
	(ii) Nitric acid is a strong oxidising agent and oxidises H_2 gas produced to water.	1	3
28.	(a) Universal indicator	1	
	(b) A/ (pH = 3)	1	
	(c) <ul style="list-style-type: none"> • Strong acids give more H^+ ions in water. / Strong acids pH 1-2 • Weak acids give less H^+ ions in water. / Weak acids pH 6-7 	1 1	

	<p>$I = 10 \text{ A}$</p> <ul style="list-style-type: none"> Current passing through electric heater is 10A which is much more than rated value (4A) of fuse. Hence fuse will melt and break the circuit. So, it cannot be used. <p style="text-align: center;">OR</p> <p>(B)</p> <ul style="list-style-type: none"> An electromagnet is formed by wrapping a current carrying insulated copper wire in the form of coil around a magnetic material like soft iron core. / By placing a magnetic material like soft iron as a core material inside the current carrying solenoid. Strength of electromagnet can be increased by increasing the <ul style="list-style-type: none"> (i) Number of turns of coil (ii) Current flowing through the coil. 	<p>$\frac{1}{2}$</p> <p>1</p> <p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>	<p>2</p>
<p>34.</p>	<p>(a) 1 Volt is the potential difference between two points in a current carrying conductor when one Joule work is done to move a charge of 1Coulomb from one point to the other. / $1V = \frac{1J}{1C}$</p> <p>(b) $V = \frac{W}{Q}$ $W = Q \times V$ $W = 1.6 \times 10^{-19} \times 100$ $W = 1.6 \times 10^{-17} \text{ J}$</p>	<p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>	<p>2</p>
<p>35.</p>	<p>(a) (i) Speed of light in medium A > Speed of light in medium B. (ii) Media B and C both have same optical density.</p> <p>(b)</p> 	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>2</p>	<p>3</p>
<p>36.</p>	<p>Rainbow is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. The water droplets act like small prisms. They refract and disperse the incident sunlight, then reflect it internally, and finally refract it again when it comes out of the raindrop.</p>	<p>2</p>	

		1	3
37.	<p>(a)</p> <ul style="list-style-type: none"> The rod AB gets displaced from its original position Because it experiences a force when placed in external magnetic field <p>(b)</p> <ul style="list-style-type: none"> Fleming's Left Hand Rule Stretch the thumb, fore finger and middle finger of your left hand such that they are mutually perpendicular. If forefinger points in the direction of magnetic field, second finger in the direction of current, then the thumb will point in the direction of motion or force acting on the conductor. 	<p>1/2</p> <p>1/2</p> <p>1</p> <p>1</p>	3
38.	<p>(a) Real / magnified.</p> <p>(b) Converging / Concave mirror, Plane mirror</p> <p>(c)</p> <ul style="list-style-type: none"> Convex lens It magnifies the image formed by the curved mirror <p style="text-align: center;">OR</p> <p>(c) The plane mirror redirects/ reflects the light rays coming from the curved mirror towards eyepiece.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p>	4

OR			
(B)			
(i)	$I = \frac{V}{R}$ $I = \frac{220}{55}$ $I = 4 \text{ A}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	
	Power of electric iron $P = VI$ $P = 220 \times 4$ $P = 880 \text{ W}$	$\frac{1}{2}$	
(ii)	$E = P \times t$ Energy (3 bulbs) = $3 \times 100 \times 5$ $= 1500$ $= 1.5 \text{ kWh}$ Energy (electric heater) = 1.0×0.5 $= 0.5 \text{ kWh}$	$\frac{1}{2}$	
	Total energy consumed (1 day) = $1.5 + 0.5 = 2 \text{ kWh}$ Total energy consumed (30 days) = 30×2 $= 60 \text{ kWh}$ $= 60 \text{ units}$	$\frac{1}{2}$	
	$\text{Total cost} = \text{Units} \times \text{Rate}$ $= 60 \times 3.60$ $= ₹ 216$	1	
(iii)	The resistivity of an alloy is generally higher than that of its constituent metals. / Alloys do not oxidise (burn) readily at high temperatures.	1	
			5