

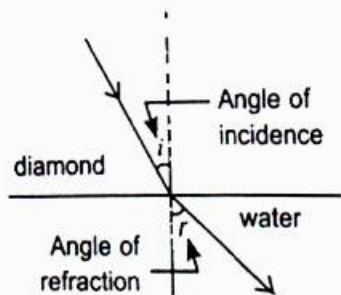
**MARKING SCHEME**  
Secondary School Examination, 2023  
**SCIENCE (Subject Code-086)**  
[ Paper Code:31/6/1]

**Maximum Marks: 80**

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	<b>SECTION -A</b>		
1.	(b)	1	1
2.	(c)	1	1
3.	(b)	1	1
4.	(a)	1	1
5.	(b)	1	1
6.	(c)	1	1
7.	(a)	1	1
8.	(d)	1	1
9.	(c)	1	1
10.	(d)	1	1
11.	(b)	1	1
12.	(b)	1	1
13.	(b)	1	1
14.	(c)	1	1
15.	(d)	1	1
16.	(d)	1	1
17.	(d)	1	1
18.	(a)	1	1
19.	(c)	1	1
20.	(a)	1	1
	<b>SECTION -B</b>		
21.	Yes	1	

	HCl is oxidised to $Cl_2$ MnO <sub>2</sub> is reduced to MnCl <sub>2</sub>	$\frac{1}{2}$ $\frac{1}{2}$	2												
22.	(a) <table border="1" style="margin-left: 40px;"> <tr> <td><b>Movement of Leaves of Sensitive plant</b></td> <td><b>Movement of shoot towards light</b></td> </tr> <tr> <td>It is not a growth related movement.</td> <td>It is due to the growth in plant stem</td> </tr> <tr> <td>Fast</td> <td>Slow</td> </tr> <tr> <td>Reversible response</td> <td>Irreversible response</td> </tr> <tr> <td>Non directional movement.</td> <td>Directional movement.</td> </tr> <tr> <td>Stimulus -touch</td> <td>Stimulus -light</td> </tr> </table> <p style="text-align: center;"><b>or any other (any two)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>(b) At synapse the electrical signals are converted into chemicals, that can easily cross the gap and pass on to the next neurons, where it is again converted into electric signals. In this way the impulse is transmitted from one neuron to another.</p>	<b>Movement of Leaves of Sensitive plant</b>	<b>Movement of shoot towards light</b>	It is not a growth related movement.	It is due to the growth in plant stem	Fast	Slow	Reversible response	Irreversible response	Non directional movement.	Directional movement.	Stimulus -touch	Stimulus -light	1,1  2	  2
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Stimulus -touch	Stimulus -light														
23.	Salivary amylase / Ptyalin – Enzyme. Salivary gland The breakdown of starch into sugar will not take place.	$\frac{1}{2}$ $\frac{1}{2}$ 1	2												
24.	• Current becomes one fourth of its original value. • According to the Ohm's law – potential difference is directly proportional to the current flowing through the conductor provided temperature remains constant. / $V \propto I$ (Temperature remaining constant for a given conductor)	1 1	2												
25.	(a) Medium B In medium B ray of light bends towards normal / $\angle r < \angle i$  (b) Refractive index of Medium 'B' with respect of Medium 'A' is  $n_{BA} = \frac{v_a}{v_b}$  <b>OR</b>	$\frac{1}{2}$ $\frac{1}{2}$  1													

(a)



(Credit marks for  $\angle i$ ,  $\angle r$  and arrows.)

(b)

$$n_{21} = \frac{n_{2a}}{n_{1a}}$$

$$\frac{1 \cdot 33}{2 \cdot 42} \quad \text{or} \quad 0.55$$

1

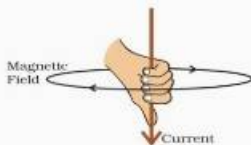
$\frac{1}{2}$

$\frac{1}{2}$

2

26. (a) **Right-Hand Thumb Rule** : Hold the current carrying conductor in right hand, such that thumb indicates direction of current, then the fingers will wrap around conductor in the direction of field lines of the magnetic field.

**Alternate answer of the statement**



- (b) **Fleming's Left Hand Rule**: Stretch the forefinger, middle finger, and thumb of the left hand such that they are mutually perpendicular to each other. If the forefinger indicates the direction of the magnetic field, the middle finger indicates the direction of current, then the thumb points in the direction of motion or force acting on the conductor.

**Alternate answer of the statement**



1

1

	<b>All the physical quantities mentioned in the diagram are mutually perpendicular to each other.</b>		2
	<b>SECTION- C</b>		
27.	<ul style="list-style-type: none"> <li>• Oxygen rich blood from the lungs comes to the left atrium of heart.</li> <li>• It then contracts and the blood is transferred to left ventricle.</li> <li>• Left ventricle in turn contracts and the blood is pumped out to the body.</li> <li>• Deoxygenated blood from the body enters the right atrium.</li> <li>• On its contraction, blood enters into right ventricle</li> <li>• Right ventricle pumps it to the lungs for oxygenation</li> </ul>	<p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p>	3
28.	<p>(a) (i) Chemical Name : Calcium Carbonate Chemical formula : <math>\text{CaCO}_3</math></p> <p>(ii) • <math>\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2 \uparrow</math></p> <p>• <math>\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) Hydrogen / <math>\text{H}_2</math></p> <p>(ii) The gas burns with a pop sound</p> <p>(iii) (1) <math>2\text{HCl} + \text{Zn} \rightarrow \text{ZnCl}_2 + \text{H}_2</math></p> <p>(2) <math>2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2</math></p>	<p>½</p> <p>½</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p> <p>1</p>	3
29.	<p>(a) • Adrenal gland ; Adrenaline hormone</p> <ul style="list-style-type: none"> <li>• Response-</li> <li>• Heart beats faster resulting in supply of more oxygen to muscles</li> <li>• Breathing rate increases</li> <li>• Blood supply to digestive system and skin gets reduced.</li> <li>• Blood supply diverted to skeletal muscles.</li> </ul> <p style="text-align: right;"><b>(any two)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>(b)</p> <p>(i) A - Sensory neuron</p> <p>B - Relay Neuron</p> <p>C - Effector organ/Muscle</p> <p>(ii) A - Carries impulse from receptor to spinal cord</p> <p>C - Responds to stimulus</p> <p>(iii) The thinking process of the brain is not fast enough / Reflex arcs are more efficient in functioning in the absence of true thought processes</p>	<p>½, ½</p> <p>1, 1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p>	3

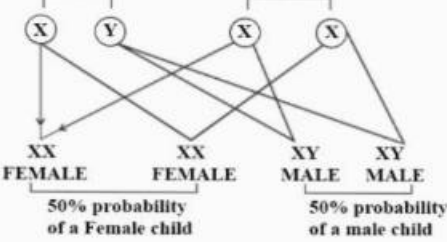
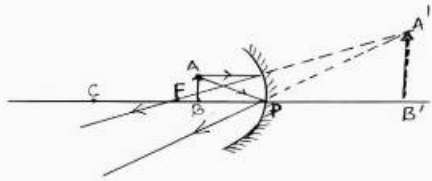




	<p>(d) 1. Plants can bear flowers and fruits earlier than those produced from seeds.</p> <p>2. It enables the propagation of plants such as banana, orange, rose and jasmine which have lost the capacity to produce seeds.</p> <p>3. The plants produced are genetically similar enough to the parent plant to have all the characteristics</p> <p style="text-align: right;"><b>(any one point)</b></p> <p>(e) During gamete formation the number of chromosomes is reduced to half. When the zygote is formed / at the time of fertilisation, fusion of male and female gametes restores the original number of chromosomes in the offspring as in the parent.</p>	<p><math>\frac{1}{2}, \frac{1}{2}</math></p> <p>1</p>	<p>5</p>
<p>36.</p>	<p>(a) (i) The property of conductor to resist the flow of charges through it.</p> <p>If Potential difference across the two ends of a conductor is 1V and the current through it is 1A, then resistance 'R' of the conductor is 1Ω.</p> <p><b>Alternate answer</b></p> $1\Omega = \frac{1 \text{ volt}}{1 \text{ ampere}}$ <p>(ii)</p> <ul style="list-style-type: none"> <li>• Length of the conductor</li> <li>• Area of cross-section of the conductor</li> <li>• Nature of the material</li> <li>• Temperature</li> </ul> <p style="text-align: right;"><b>( any two)</b></p> <p>(iii) (1) The resistance will become one half of its original value.</p> $R = \rho \frac{l}{A} = \rho \frac{l}{\pi r^2}$ $R' = \frac{\rho \cdot 2L}{\pi(2r)^2}$ <p>(2)</p> $R' = \frac{\rho \cdot l}{\pi(2r)^2} \cdot \frac{2}{4} = \frac{R}{2}$ <p>Resistance will reduce to one half.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) (i) No</p> <ul style="list-style-type: none"> <li>• In series combination overall resistance will increase hence decreasing the current . Potential difference also divides. Therefore power consumption is less by each bulb and glows with less brightness.</li> </ul>	<p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p><math>\frac{1}{2}</math></p> <p>1</p> <p>1</p>	

	<ul style="list-style-type: none"> <li>In parallel combination each bulb will get the required potential difference hence the required current and will glow with its normal brightness.</li> </ul> <p>(ii) None of the bulb glows in series combination as the circuit gets broken and current stops flowing.</p> <p>In parallel combination the other two bulbs will glow with same brightness as the same voltage is available to them.</p>	1					
		1					
		1					
			5				
	<b>SECTION- E</b>						
37.	<p>(a) By electrolytic reduction</p> <p>(b) Carbon cannot reduce the oxides of highly reactive metals / these metals have more affinity for oxygen than carbon.</p> <p>(c) When Cinnabar is heated in the presence of air, it is first converted into mercuric oxide. / This is then reduced to mercury.</p> $2\text{HgS} + 3\text{O}_2 \xrightarrow{\text{heat}} 2\text{HgO} + 2\text{SO}_2$ $2\text{HgO} \xrightarrow{\text{heat}} 2\text{Hg} + \text{O}_2$ <p style="text-align: center;"><b>OR</b></p> <p>(c)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Roasting</th> <th style="width: 50%; text-align: center;">Calcination</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> <p>A process in which sulphide ores are converted into oxides by heating strongly in the presence of excess air</p> <math display="block">2\text{ZnS} + 3\text{O}_2 \xrightarrow{\text{heat}} 2\text{ZnO} + 2\text{SO}_2</math> </td> <td style="padding: 5px;"> <p>A process in which carbonate ores are heated in limited supply air.</p> <math display="block">\text{ZnCO}_3 \xrightarrow{\text{heat}} \text{ZnO} + \text{CO}_2</math> <p style="text-align: right;"><b>(or any other)</b></p> </td> </tr> </tbody> </table>	Roasting	Calcination	<p>A process in which sulphide ores are converted into oxides by heating strongly in the presence of excess air</p> $2\text{ZnS} + 3\text{O}_2 \xrightarrow{\text{heat}} 2\text{ZnO} + 2\text{SO}_2$	<p>A process in which carbonate ores are heated in limited supply air.</p> $\text{ZnCO}_3 \xrightarrow{\text{heat}} \text{ZnO} + \text{CO}_2$ <p style="text-align: right;"><b>(or any other)</b></p>	1	
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		1					
		1					
		½					
		½					
			4				
38.	<p>(a) Zygote – 23 pairs / 46 chromosomes. Gamete – 23 chromosomes.</p> <p>(b) The temperature at which fertilised eggs are kept determines whether the animals developing in the eggs are male or female.</p>	½					
		½					
		1					



<p>(c)</p>	<p style="text-align: center;"><b>Sex determination in Human beings</b></p> <p><b>PARENTS:</b>      <b>FATHER</b>                      <b>MOTHER</b></p> <p style="text-align: center;">XY    XX</p>  <p style="text-align: center;"><b>OR</b></p> <p>(c) The 23<sup>rd</sup> pair or the sex chromosome in human females contains 'XX' chromosome. At the time of gamete formation, each gamete gets one X-chromosome.</p>	2	
<p><b>39.</b></p>	<p>(a) Real, inverted, diminished (Any two)</p> <p>(b) Case II</p> <p>Because focal length of mirror is 15 cm, object distance is 30cm which means the object is placed at C.</p> <p>(c) Dentists use concave mirrors</p> <p>Because concave mirror forms erect and enlarged image when object is very close to the mirror.</p> <p style="text-align: center;"><b>OR</b></p> <p>(c) Case III</p>  <p>(Deduct ½ mark if direction of ray is not marked.)</p>	<p>½, ½</p> <p>½</p> <p>½</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	4

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