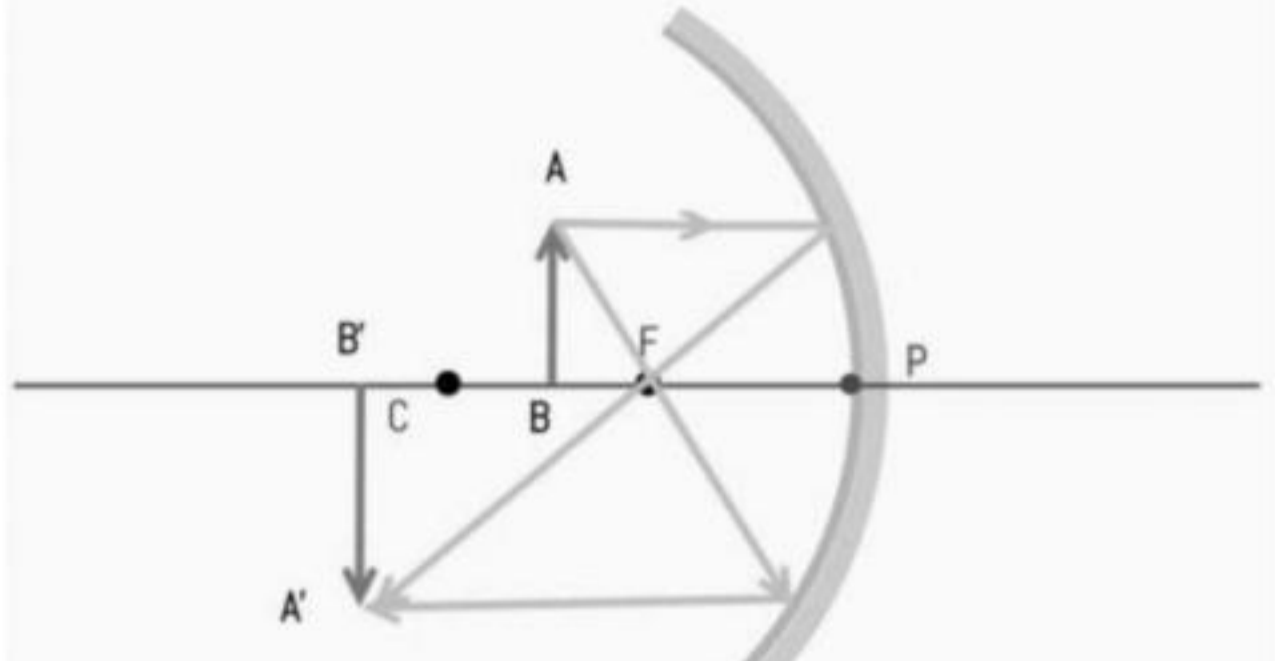


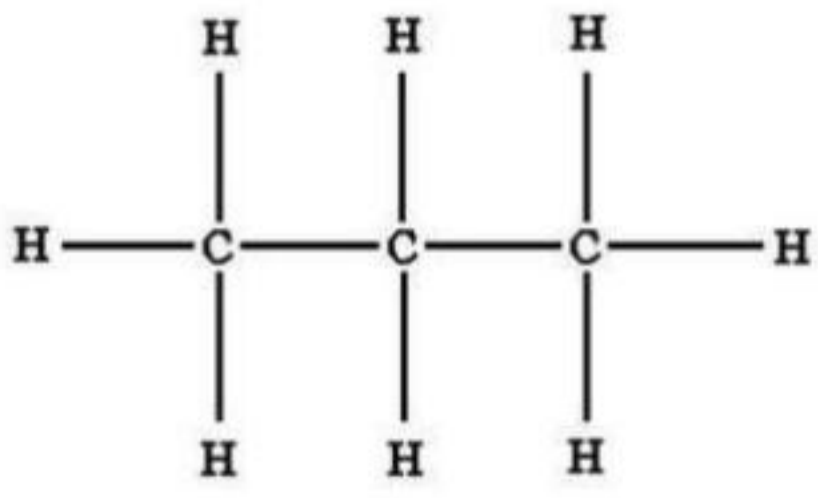
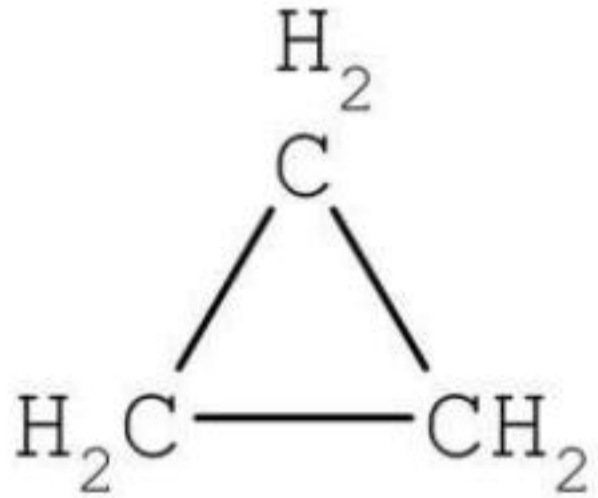
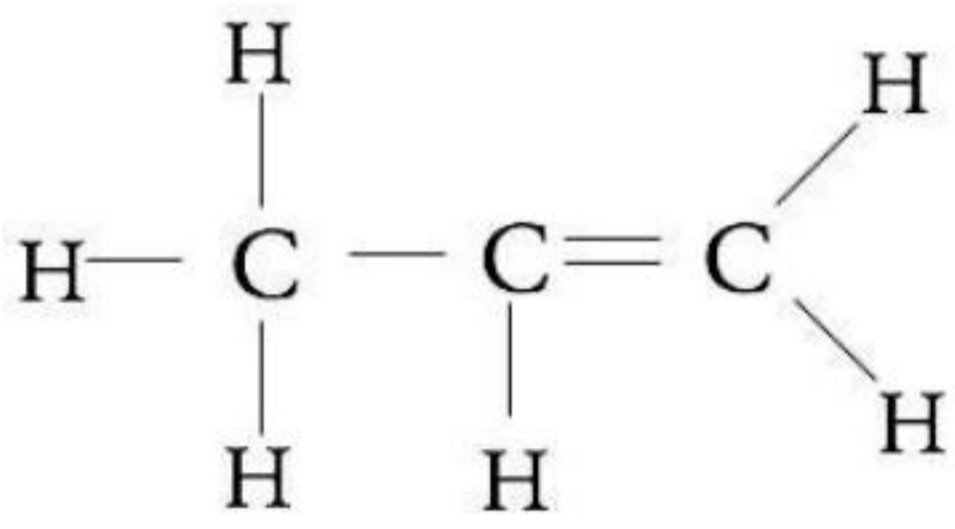
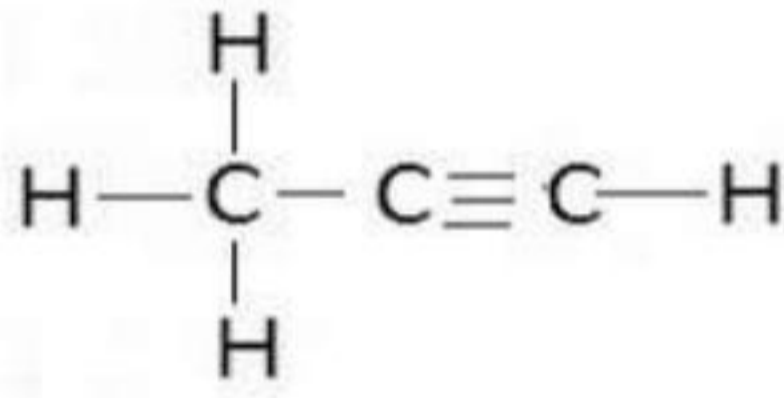
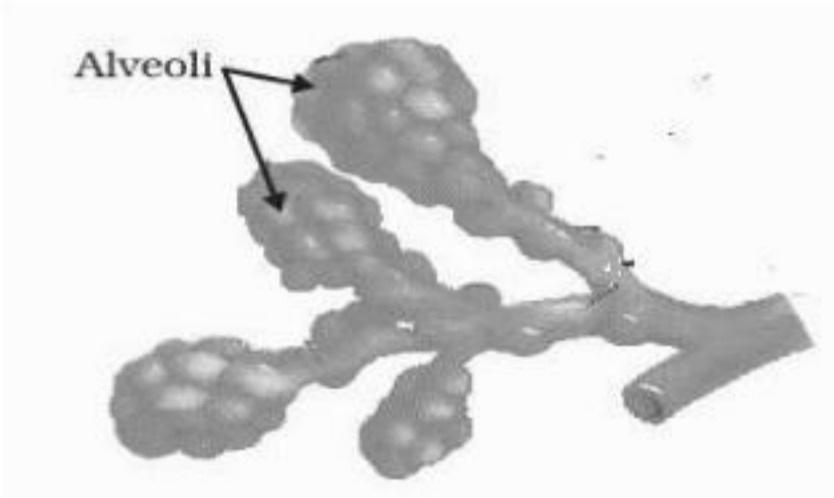
MARKING SCHEME
Secondary School Supplementary Examination, July - 2023
SCIENCE (Subject Code-086)
[Paper Code: 31/C/1]

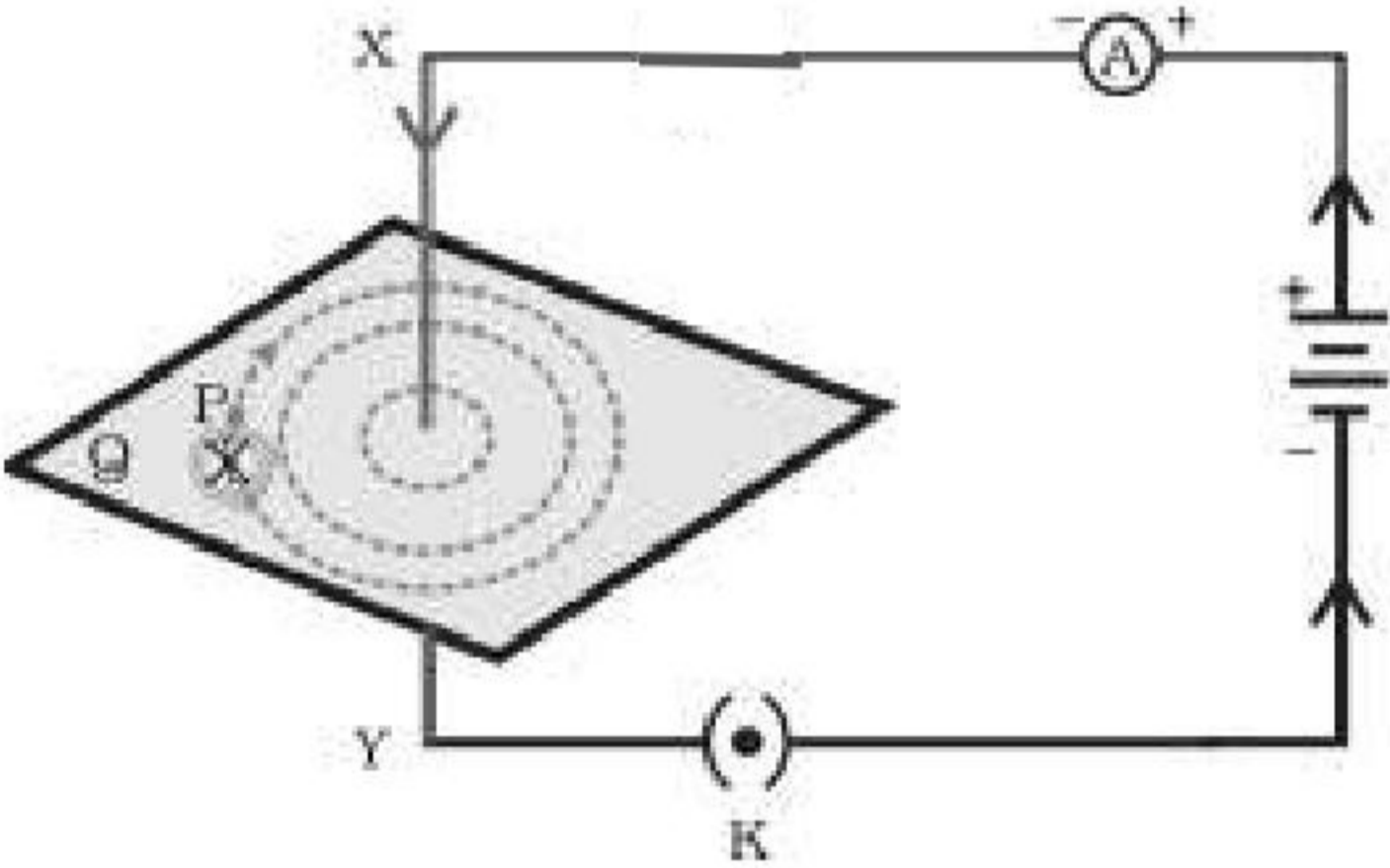
Maximum Marks : 80

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1	(d)	1	1
2	(a) / (c)	1	1
3	(c)	1	1
4	(b)	1	1
5	(c)	1	1
6	(b)	1	1
7	(c)	1	1
8	(d)	1	1
9	(c)	1	1
10	(d)	1	1
11	(a)	1	1
12	(a)	1	1
13	(d)	1	1
14	(a)	1	1
15	(c)	1	1
16	(a)	1	1
17	(d)	1	1
18	(b)	1	1
19	(c)	1	1
20	(d)	1	1
	SECTION— B		
21	(a) A = Potassium / K or Sodium /Na B = Calcium / Ca or Magnesium / Mg C = Aluminium / Al or Iron / Fe or Zinc / Zn D = Lead / Pb or Copper / Cu or Silver / Ag or Gold / Au	$\frac{1}{2} \times 4$	

	OR																							
	(b) (i) (1) Sodium chloride -yellow (2) Calcium chloride – brick red (credit full marks for any other colour)	1/2 1/2																						
	(ii) No Justification : Because they are ionic or electrovalent compounds which are insoluble in organic solvents	1/2 1/2	2																					
22	<ul style="list-style-type: none"> Prostate gland, and seminal vesicles 1) It provides nutrition to the sperms. 2) It makes the transport of sperms easier through the fluid medium. 	1/2, 1/2 1/2 1/2	2																					
23	<table border="0"> <tr> <td></td> <td style="text-align: center;">MOTHER</td> <td style="text-align: center;">FATHER</td> </tr> <tr> <td style="text-align: center;">PARENTS</td> <td style="text-align: center;">XX</td> <td style="text-align: center;">XY</td> </tr> <tr> <td></td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;">GAMETES</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X, Y</td> </tr> <tr> <td></td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;">ZYGOTE</td> <td style="text-align: center;">XX</td> <td style="text-align: center;">XY</td> </tr> <tr> <td style="text-align: center;">OFFSPRINGS</td> <td style="text-align: center;">Girl</td> <td style="text-align: center;">Boy</td> </tr> </table>		MOTHER	FATHER	PARENTS	XX	XY		↓	↓	GAMETES	X	X, Y		↓	↓	ZYGOTE	XX	XY	OFFSPRINGS	Girl	Boy	Diagram Labelling	1 1 2
	MOTHER	FATHER																						
PARENTS	XX	XY																						
	↓	↓																						
GAMETES	X	X, Y																						
	↓	↓																						
ZYGOTE	XX	XY																						
OFFSPRINGS	Girl	Boy																						
	(Award 1 mark if explained through words only)																							
24	<p>(a)</p> $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ $= \frac{1}{-15} - \frac{1}{-20} = \frac{-1}{60}$ $v = -60 \text{ cm}$ $m = \frac{-v}{u}$ $= -\frac{-60}{-20} = -3$ <p style="text-align: center;">OR</p> <p>(b)</p> 	Diagram Direction of the rays	1/2 1/2 1/2 1 1/2 1/2 2																					

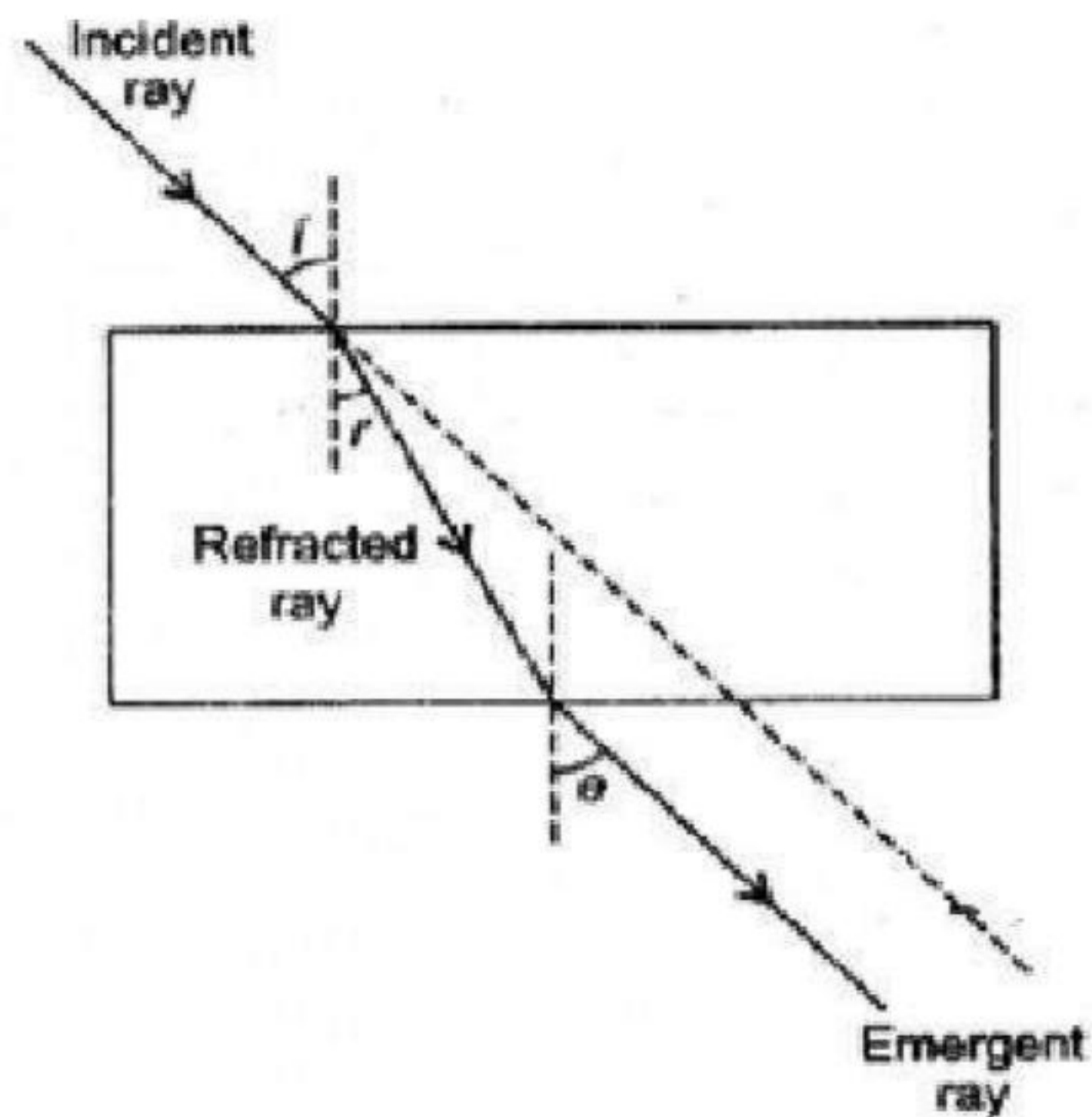
25	<p>Short circuiting / fuse will blow or melt / break in circuit. (any one)</p> <p>Justification:</p> $I = \frac{P}{V} = \frac{3000 \text{ W}}{220 \text{ V}} = 13.6 \text{ A}$ <p>As the current rating is only 10 A and the oven draws a current of 13.6 A, which is more than the current rating. Hence the oven will stop working.</p>	1					
26	<p>(a) Cloth bag is biodegradable / eco-friendly.</p> <p>(b) i. segregation of biodegradable and non-biodegradable waste at source. ii. By composting iii. Recycling of solid wastes</p> <p>(any two) (any other suitable way)</p>	1	2				
SECTION—C							
27	<ul style="list-style-type: none"> The process in which plants/autotrophs take in substances from outside and convert them into stored form of energy. / The process in which CO₂ and water is converted into carbohydrates in the presence of sunlight and chlorophyll. / $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ <p style="text-align: center;">(Glucose)</p> <ul style="list-style-type: none"> Chloroplast leaves / green part of the plant. water stored as starch 	1	3				
28	<p>(a)</p> <p>(i) 'X' is Ethanol / C₂H₅OH</p> <p>(ii)</p> $2\text{C}_2\text{H}_5\text{OH} + 2\text{Na} \longrightarrow 2\text{C}_2\text{H}_5\text{O}^-\text{Na}^+ + \text{H}_2$ $\text{C}_2\text{H}_5\text{OH} \xrightarrow[443\text{K}]{\text{H}_2\text{SO}_4(\text{conc})} \text{CH}_2=\text{CH}_2 + \text{H}_2\text{O}$ <p style="text-align: center;">(Do not deduct marks if equations are not balanced)</p> <ul style="list-style-type: none"> Sulphuric acid acts as a dehydrating agent. <p style="text-align: center;">OR</p> <p>(b) (i) due to the formation of strong covalent bonds.</p> <p>(ii)</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Saturated compounds</td> <td style="width: 50%;">Unsaturated compounds</td> </tr> <tr> <td>• Compounds containing</td> <td>• Compounds containing carbon-</td> </tr> </table>	Saturated compounds	Unsaturated compounds	• Compounds containing	• Compounds containing carbon-	1	1
Saturated compounds	Unsaturated compounds						
• Compounds containing	• Compounds containing carbon-						

	carbon- carbon single bonds.	carbon double or triple bonds. (Any other difference)	1	
	<ul style="list-style-type: none"> Structure of saturated compound 		1/2	
	<ul style="list-style-type: none"> Structure of unsaturated compound 	 <p>(any one in each)</p>	1/2	3
29	<p>(a) Within the lungs when the air passage divides into smaller and smaller tubes which finally terminate into balloon- like structures, these are called alveoli. /</p>  <p>Function – It provides a surface where the exchange of gases takes place.</p> <p>(b) It is the volume of air left in the lungs after exhalation.</p>		1 1	3
30	<ul style="list-style-type: none"> Exchange of gases through stomata. By the process of respiration. The guard cells absorb water and swell causing the stomatal pore to open. The guard cells lose water and shrink and hence the pore closes. 		1/2 1/2 1 1	3
31	<ul style="list-style-type: none"> It is the phenomenon of scattering of light by the colloidal particles due to which the path of the light becomes visible. Examples: <ol style="list-style-type: none"> When sunlight passes through a canopy of dense forest. A fine beam of sunlight enters a smoke/ dust filled dark room through a small hole. Explanation: When a beam of light passes through a heterogenous mixture of minute particles (dust, smoke etc) it is reflected diffusely by the particles and gets scattered. This scattering of light makes the beam of light visible. 		1 1/2 1/2 1	3

32	<p>(a)</p> <p>(i) Solenoid : A coil of many turns of insulated copper wire wrapped closely in the shape of cylinder. Circular coil : Straight wire bent in the form of circular loop with many turns.</p> <p>(ii) By taking a non-conducting cylindrical tube and winding a long, insulated copper wire tightly over it in the shape of a spring such that the turns are closely placed and lie side by side.</p> <p>(iii) To magnetise a piece of magnetic material like soft iron / To make an electromagnet (any one)</p> <p style="text-align: center;">OR</p> <p>(b)</p> <div style="text-align: center;">  </div> <p style="text-align: right;">Diagram</p> <p style="text-align: right;">Labelling of magnetic field</p> <p>(Please check the direction of magnetic field lines corresponding to the direction of current in the conductor.)</p> <ul style="list-style-type: none"> Right hand Thumb Rule : Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field. 	1 1 1 1 1 1	 3
33	<ul style="list-style-type: none"> Trophic level – Various steps or levels in a food chain (i) secondary consumer – third trophic level. (ii) tertiary consumer – fourth trophic level. 1. Death of all organisms at one trophic level will lead to ecological imbalance / disrupt the food chain. 2. Organisms of the next level will starve to death / enter other food chain / organisms of the previous level will multiply profusely / (any other) 	1 ½ ½ ½ ½	 3
SECTION—D			
34	<p>(a)</p> <p>(i) (2) Magnesium hydroxide</p> <p>(ii) (2) Ca(OH)₂ and (4) NaOH</p>	1 ½+ ½	

	<p>(iii)</p> <ul style="list-style-type: none"> • NH₃ / Ammonia • NH₄OH / Ammonium hydroxide <p>(iv) To neutralize the effect of acid in the bee sting.</p> <p>(v) (1) Oxalic acid (2) Tartaric acid</p> <p style="text-align: center;">OR</p> <p>(b)(i) It is the fixed number of water molecules present in one formula unit of salt.</p> <p>(ii) Hydrated copper sulphate / Copper sulphate penta hydrate. CuSO₄.5H₂O</p> <p>(iii)</p> <ul style="list-style-type: none"> • CaOCl₂ • Chemical equation $\text{Ca(OH)}_2 + \text{Cl}_2 \longrightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$ • Uses – 1. For bleaching cotton and linen in textile industry. 2. As an oxidising agent in a chemical industry. 3. For disinfecting water. <p style="text-align: right;">(or any other)</p>	<p>½</p> <p>½</p> <p>1</p> <p>½+ ½</p> <p>1</p> <p>½</p> <p>½</p> <p>½</p> <p>1</p> <p>½ ×3</p>	<p>5</p>
35	<p>(a)</p> <p>(i) (1) Ovary</p> <p>(2) Oviduct / Fallopian tube</p> <p>(3) Lining of the uterus</p> <p>(ii) (1) zygote is formed</p> <p>(2) when egg is not fertilised, egg lives for about one day, the lining of the uterus slowly breaks down and comes out through vagina along with blood and mucous.</p> <p style="text-align: center;">OR</p> <p>(b) (i)</p> <p>(1) Unisexual flower – contains either stamens or pistil. eg: Papaya/ Water melon (any other)</p> <p>(2) Bisexual flower – contains both stamens and pistil eg: Hibiscus / mustard (any other)</p> <p>(ii) A – Pollen Grain B – Stigma C – Pollen tube D – Female germ-cell / egg cell</p> <p>(iii) Transfer of pollen is required for fusion of gametes. / Pollen needs to be transferred from the stamen to the stigma as it brings male germ-cell (Pollen) + female germ-cell (egg) together for fusion.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½ ×4</p> <p>1</p>	<p>5</p>

36	<p>(a)</p> <ul style="list-style-type: none"> • kilowatt hour or kWh • $1 \text{ kWh} = 1000\text{W} \times 3600 \text{ seconds}$ $= 3.6 \times 10^6 \text{ watt seconds}$ $1 \text{ kWh} = 3.6 \times 10^6 \text{ Joule}$ <p>(b) $P = 8 \text{ W}$; $V = 220 \text{ V}$; Current rating = 1.0 A</p> <p>Current through each lamp = $\frac{8 \text{ W}}{220 \text{ V}}$</p> <p>Number of lamp = $\frac{\text{current rating}}{\text{current through each lamp}}$ $= \frac{1.0\text{A}}{\frac{8\text{W}}{220 \text{ V}}} = \frac{220}{8} = 27.75$</p> <p>So, 27 lamps can safely be used in the circuit.</p>	1 ½ 1 1 ½ 1	5						
SECTION - E									
37	<p>(a)</p> <ul style="list-style-type: none"> • Middle • Sulphides /Carbonates/Oxide (any one) <p>(b)</p> <table border="1" data-bbox="426 1319 1282 1557"> <thead> <tr> <th>Roasting</th> <th>Calcination</th> </tr> </thead> <tbody> <tr> <td>Ore is heated in excess of air.</td> <td>Ore is heated in the absence or limited supply of air.</td> </tr> <tr> <td>This is used for sulphide ores.</td> <td>This is used for carbonate ores.</td> </tr> </tbody> </table> <p>(Any one difference)</p> <p>(c)</p> <ul style="list-style-type: none"> • Galvanization – coating of iron object with a thin layer of zinc. • Alloying – A mixture of two or more metals or a metal and a non-metal. <p style="text-align: right;">(or any other)</p> <p style="text-align: center;">OR</p> <p>(c) The reaction between aluminium and iron oxide is highly exothermic which forms molten iron which is used in welding cracked machine parts.</p> $\text{Fe}_2\text{O}_3(\text{s}) + 2\text{Al}(\text{s}) \rightarrow 2\text{Fe}(\text{l}) + \text{Al}_2\text{O}_3(\text{s}) + \text{Heat}$	Roasting	Calcination	Ore is heated in excess of air.	Ore is heated in the absence or limited supply of air.	This is used for sulphide ores.	This is used for carbonate ores.	½ ½ 1 1 1 1	4
Roasting	Calcination								
Ore is heated in excess of air.	Ore is heated in the absence or limited supply of air.								
This is used for sulphide ores.	This is used for carbonate ores.								
38	<p>(a) • Bony box / Cranium, fluid filled balloon</p> <p>(b) •</p> <ol style="list-style-type: none"> Sensory neuron – pass information from receptors to spinal cord. Motor neuron – transmit information from spinal cord to effector organ / muscle. <p>(c) (i) Cerebellum / Hind Brain – Voluntary Action (ii) Medulla / Hind Brain - Involuntary Action</p>	½, ½ ½ ½ ½+ ½ ½+ ½							

	OR		
	(c) Through Peripheral nervous system • Cranial nerves, and Spinal nerves	1 ½, ½	4
39	(a) The refractive index of a medium with respect to air or vacuum / Absolute refractive index of a medium = $\frac{\text{speed of light in air(vacuum)}}{\text{speed of light in medium}}$ (b) (i) speed of light is more in water (ii) bends away from normal (c) Absolute refractive index of a medium = $\frac{\text{speed of light in vacuum}}{\text{speed of light in medium}}$ $\frac{3}{2} = \frac{\text{speed of light in vacuum}}{2 \times 10^8}$ Speed of light in vacuum = 3×10^8 m/s Speed of light in water = $\frac{3}{4} \times 3 \times 10^8$ m/s = $\frac{9}{4} \times 10^8$ m/s OR (c) 	1 ½ ½ ½ ½ 1	
		Diagram Labelling	1 1 4
