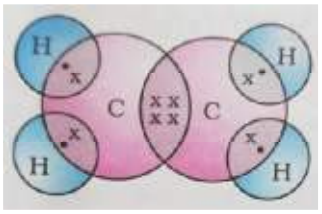
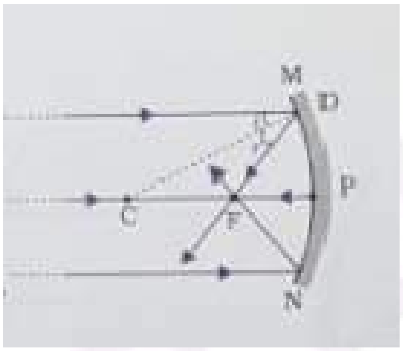
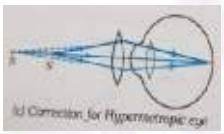
SET 31 / 2 / 1

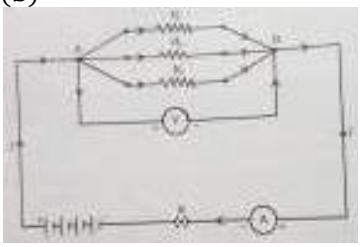
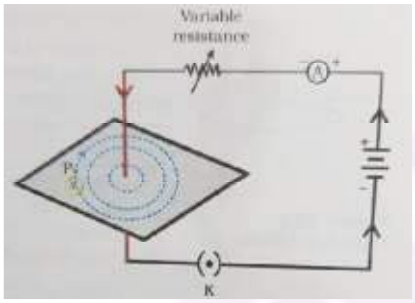
Q.No	Value Point/Expected Answer	Value	Total Marks
	SECTION A		
A 1	Timber / Bidi / Paper / Medicine (any Two)	½ + ½	1
A 2	Due to high resistivity of alloys rather than its constituting metals.	1	1
	SECTION B		
A 3	Molecular formula - C_2H_4  	1 1	2
A 4	(a) Lustre, ductile, malleable, least reactive (any two) (b) Na & K are highly reactive (in air & moisture) OR Silver — sulphur in air — Product: Silver sulphide Copper — Moisture & Carbon dioxide — Copper Carbonate	½ + ½ 1 ½ + ½ ½ + ½	2
A 5	$\mu = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in Ruby}} = \frac{c}{v}$ $V=\frac{c}{\mu}$ c= velocity of light μ= refractive index $v=\frac{3\times10^8}{1.7} = 1.76 \times 10^8\ m/s$	½ ½ ½ + ½	2
A 6	**SECTION C** (a) Decomposition / Thermal decomposition, The gas X is NO_2 or (nitrogen dioxide) (b) $2Cu(NO_3)_2 \xrightarrow{Heat} 2CuO + 4NO_2 + O_2$ (c) Range less than 7 (or O------6.9pH) Note: For (b) ½ mark for equation and ½ mark for balancing the equation	½ ½ 1 1	3
A 7	(a) The process of diluting an acid is highly exothermic ,	1	

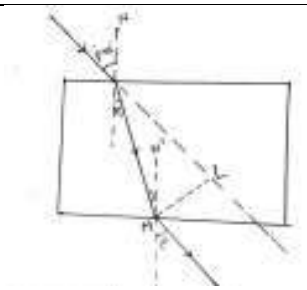
	and on the addition of acid to the water the excess heat is absorbed by water. (b) Because HCl does not form H^+/H_3O^+ ions in dry condition. OR • When electricity is passed through an aqueous solution of sodium chloride (brine) • Chlor – alkali process • X - Cl_2 • Y = $CaOCl_2$ • $2NaCl_{(aq)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + Cl_{2(g)} + H_{2(g)}$ • $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$	1 1 ½ ½ ½ ½ ½ ½	3
A 8	• Metal oxides showing both acidic and basic nature • Example: Al_2O_3 / ZnO (or any other) • $Al_2O_3 + 6HCl \rightarrow 2AlCl_3 + 3H_2O$ $Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$ **(Or any other example of equations)**	½ ½ 1 1	3
A 9	• A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called a homologous series. • Example – Alkane / Alkene / Alkyne / Alcohol or any other one correct example. • Characteristics:- (i) They have same general formula (ii) They have same functional group (iii) The difference in the molecular mass of two successive member in 14µ (iv) The difference in the molecular formula of two successive member is of CH_2 unit. (v) They have similar chemical properties. **(Any three points)**	1 ½ ½ x3	3
A 10	<table><tr><th></th><th>Autotrophic Nutrition</th><th></th><th>Heterotrophic Nutrition</th></tr><tr><td>1</td><td>They can prepare their own food</td><td>1</td><td>They cannot prepare their own food.</td></tr><tr><td>2</td><td>They require raw materials like CO_2, H_2O in the presence of sunlight and chlorophyll to prepare their food.</td><td>2</td><td>They depend on other plants & animals for their food.</td></tr><tr><td>3</td><td>They store the food in the form of starch.</td><td>3</td><td>They store the food in the form of glycogen.</td></tr></table>**Any other point**	1 x 3	3
A 11	• The loss of water in the form of vapour from the aerial parts/leaves/stems is known as transpiration. • Functions:- (i) It helps in the absorption and upward movement of water (ii) movement of dissolved minerals from root to leaves. (iii) It helps in the temperature regulation or cooling of the plant. **(Any two points)** OR	1 1+1	

	(a) The transport of soluble products of photosynthesis (food or glucose) from one part to the other parts of the plant. To provide food to all parts of the plant. (b) Root, fruits, seeds and other growing organs/parts of the plant. **(any two)**	1 1 ½ + ½	3
A 12	Female reproductive part of the plant Stigma – receive pollen grains Style – passage for the growth of pollen tube Ovary – Site for fertilization **If any two parts with function attempted award 1½ marks only**	**1** 1+1	3
A 13	(a) Move the mirror/paper to focus the rays at one point (b) Concave mirror (c) Yes, distance between mirror and focal point gives approximate focal length.  OR $\frac{1}{v}-\frac{1}{u}=\frac{1}{f} \quad \therefore \quad \frac{1}{v}=\frac{1}{f}+\frac{1}{u}$ $\therefore \frac{1}{v}=\frac{1}{12}+\frac{1}{(-18)}$ $\therefore \quad v = 36\text{cm}$ $m=\frac{v}{u}=\frac{h'}{h} \quad \therefore \quad m =$ $\Rightarrow \frac{36}{-18}=\frac{h'}{10}$ $\Rightarrow h' = -20\text{cm}$ (size of the image) Nature of image – Real and inverted	½ ½ ½ + ½ ½ + ½ ½ 1 ½ ½ ½	3
A 14	A device that converts solar energy directly into electrical energy. A large no. of solar cells are combined in an arrangement called Solar Cell Panel. Principal Advantages – (i) They have no moving parts (ii) require little maintenance & work quite satisfactorily without the use of any focusing	1 1	

	device. (iii) These cells can be set up in remote & inaccessible areas where laying of a power transmission may be expensive. (any two)	1+1	3
A 15	It shields the surface of the earth from the UV radiation from the sun. $O_2 \xrightarrow{UV} O + O$ $O_2 + O \rightarrow O_3$ {or description of this process in words} Chloro Fluoro Carbons (CFC's) Reduce the use of CFC's by (a) minimizing the leakage through air conditioners and refrigerators / finding substitute chemicals that are ozone friendly.	1 1 ½ ½	3
A 16	**SECTION D** **(a)** (i) No fixed position of H in the periodic table. (ii) Position of isotopes not clear. (iii) Atomic mass does not increase in a regular manner. (or any other) **(b)** (i) Left to right metallic character decreases Reason: Effective nuclear charge increases / tendency to loose electrons decrease / electro positivity decreases (any one reason) (ii) Top to bottom metallic character increases Reason :- Size of atom increase/tendency to loose electron increases (any one reason) OR A B C D 1 3 5 7 • Group no. 1^{st} 13^{th} 15^{th} 17^{th} • B = 2, 8, 3 D = 2 , 8 , 7 • BD_3	1 1 1 ½ ½ ½ ½ ½ x 4 1+1 1	5
A 17	(a) • Iodine is essential for functioning of thyroid / formation of thyroxine hormone • Disease is Goitre • Swollen neck (b) Impulse travels from dendrite to cell body, then along the axon to its end. At the end some chemicals are released which fill the gap of synapse, and starts a similar electrical impulse to another neuron and the impulse further travel in the body. (Award marks if attempted as a flow chart also) OR The movement/response of part of plant (root) towards water Experiment:- (i) Soak the seeds in water overnight (ii) Place moist cotton in a perforated petridish (iii) Put the soaked seeds in the petridish & place it on a beaker (iv) Roots pass through pores and grow downwards. (v) After sometime roots will bend towards base of petridish having moisture..	1 1 1 2 1 ½ ½ 1 1 1	5

	(Or Any other relevant experiment)		
A 18	(a) The organs having similar origin / structures but performing different functions Example: limbs of frog, limbs of lizard, bird, human (any two) (b) Parents Male x Female XY XX Gametes: X , Y X X Zygote: XX XY Sex: Girl Boy Hence, sex determination is purely a matter of chance.	1 ½ + ½ 1 1 1	5
A 19	Myopia:- Difficult to see the objects placed far away / Hypermtropia: Difficult to see very close or nearby objects. Causes of hypermetropia – (i) The focal length of the eye lens is too long (ii) eye ball has become too small  Note: Diagram with brief description -03; only correct diagram with labelling -2 or only explanation 01	1 ½+½ 3	5
A 20	(a) (i) Join the three resistors of different values in series (ii) Connect them with battery, an ammeter and plug key. (iii) Plug the key and note the ammeter reading (iv) Change the position of ammeter to anywhere in between the resistors and note the ammeter reading each time. (v) The ammeter reading will remain same everytime. Therefore when resistors are connected in series same current flows through all resistors, when it is connected to a battery. Note: If explained with the help of diagram give full credit (b) Total resistance of the circuit = $R = R_1 + R_2 + R_3 = 5 + 10 + 15 = 30$ ohm Potential difference across the circuit / By ohm's law $V = IR$ or $I = \frac{V}{R} = \frac{30V}{30ohm} = 1A$ Potential difference across 15 ohm Resistor = 1A X 15 ohm = 15 volt OR **(a)** Total current $I = I_1 + I_2 + I_3$ Let R_P be the equivalent resistance of R_1, R_2, R_3. Then the total current $I = \frac{V}{R_P}$ (i) On applying ohm's law for each R_1, R_2,R_3	½ x 5 1 1 ½ 1	

	$I_1 = \frac{V}{R_1}$, $I_2 = \frac{V}{R_2}$, $I_3 = \frac{V}{R_3}$ $\therefore \quad I = V\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right) = \frac{V}{R_P}$ $\therefore \quad \frac{1}{R_P} + \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ **(b)**  $\frac{1}{R_P} = \frac{1}{20} + \frac{1}{20} = \frac{2}{20} = \frac{1}{10}$ $\Rightarrow$ R_p = 10 ohms Equivalent resistance of the network = $R_{eq} = R_1 + R_p = 10 + 10 = 20$ *ohm*	½ ½ ½ ½ 1 1	5
A 21	 Diagram 1 ½ and direction ½ Statement of right hand thumb rule. The magnetic field strength decreases with increase of distance from the current carrying conductor. Reason: There is inverse relation between field strength and distance from current carrying conductor. Note: Direction of magnetic field should be in accordance with direction of current	1+1 1 1 1	5
A 22	**SECTION E** • The pH value of water given is incorrect. • Its correct value is 7 it is neutral in nature. OR • There will be no reaction in the beakers having Fe strip & Cu strip. • The solution having Al & Zn strip will show reaction / the solution of $FeSO_4$ having Al & Zn strip will become colourless.	1+1 1+1	2
A 23	• Brisk effervescense of CO_2 evolved. • $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2 + H_2O$	1 1	

			2
A 24	(i) Soaking of seeds (ii) Emergence of radicle (iii) Splitting of cotyledons (iv) Emergence of plumule OR (i) Elongation of nucleus (ii) Constriction appears due to the division of the cytoplasm	½ ½ ½ ½ 1 1	2
A 25	(i) Size of the leaf peel should be very small. (ii) Put peel immediately in the drop of water. (iii) Place cover slip carefully to avoid the air bubbles. (iv) It should not be overstained. (v) No fold in the peel **(Any four)**	½ x 4	2
A 26	 Labelling • Angle of refraction (r_1) • Angle of emergence (e) • Lateral displacement (ML) OR  Labelling of ∠i + ∠e + ∠r & ∠D	½ ½ x3 ½x4	2
A 27	(a) ∠ least count of ammeter = 10 mA ∠ least count of Voltmeter = 0.1 V (b) $\frac{2.4}{0.25}$ =9.6 ohm (250mA = 0.25A)	½ + ½ ½ + ½	2