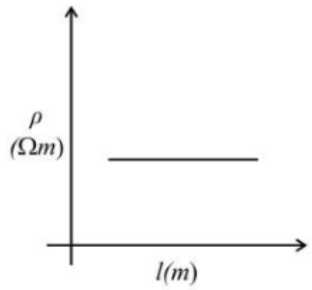
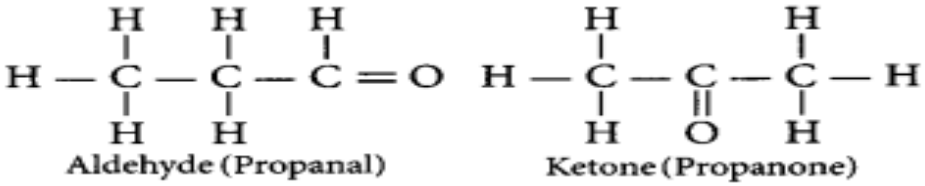
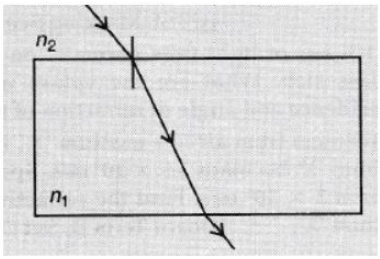
BANGALORE SAHODAYA SCHOOLS COMPLEX ASSOCIATION
PRE-BOARD EXAMINATION 1 (2024-2025)
Grade X
MARKING SCHEME

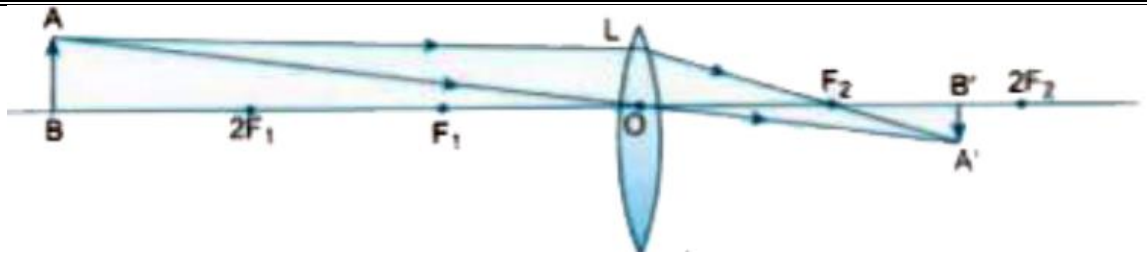
Time:3hrs **SUBJECT: SCIENCE (086) SET 1** Marks: - 80

Section-A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

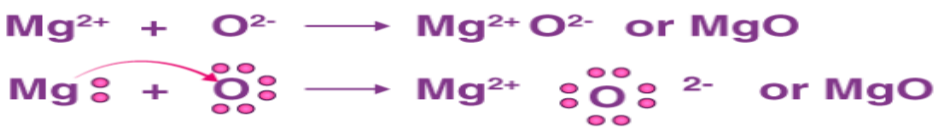
1	(C) M > K > L > H	1
2	(b) They involve the reaction of a non-metal with oxygen	1
3	(d) Hydrochloric acid	1
4	(d) (ii) and (iv)	1
5	(a) (ii) only	1
6	(b) Lead acetate	1
7	(c) Emulsion of the dirt in the micelles.	1
8	(b) 1→3 in presence of 2	1
9	(d) Emulsification	1
10	(c) (iii) and (iv)	1
11	(d) Dendrite	1
12	(a) 1%	1
13	(b) Convex lens	1
14	(d)v = +5cm, f= +10cm and h = +7.5cm	1
15	 (d)	1
16	(d)Out of the field	1
17	(a) AgBr is a chemical compound. It is widely used in photography as photographic emulsions.	1
18	(a) Both A and R are true, and R is the correct explanation of A.	1
19	(c) A is true but R is false.	1
20	b) Both A and R are true, and R is not the correct explanation of A.	1
Section-B **Question No. 21 to 26 are very short answer questions**		
21	(i) Give reason for the following: (a) Aluminium oxide Al_2O_3 is a metal with a lower electropositive value. It is an amphoteric oxide because it reacts with acids and bases to form salts and water. (1M)	2

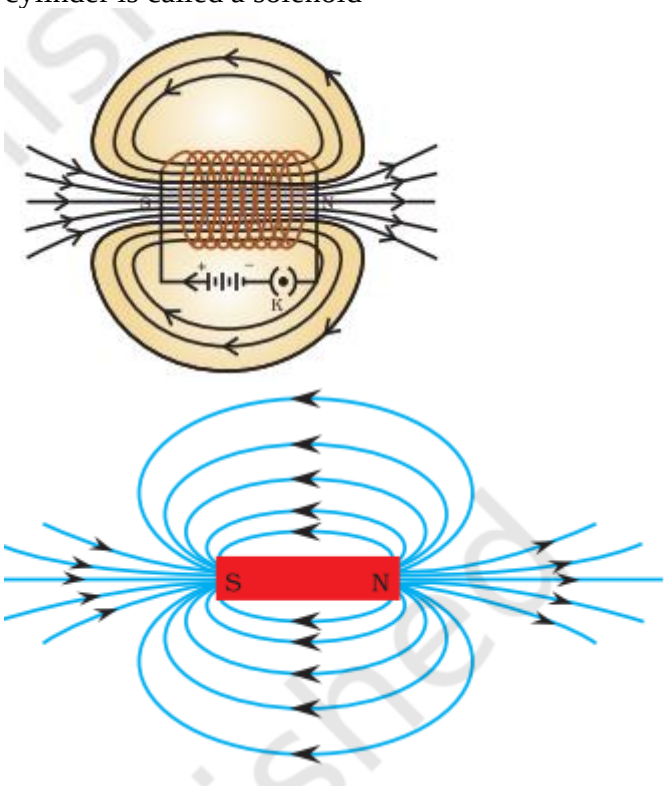
	(b) The citric acid present in the lemon or tamarind neutralises the basic copper carbonate and dissolves the layer. That is why tarnished copper vessels are cleaned with lemon or tamarind juice to give the surface of the copper vessel its characteristic lustre. (1M) **OR** (a) In diamond, each carbon atom is bonded to four other carbon atoms forming a rigid three-dimensional structure. This makes diamond the hardest known substance. Thus, it has a high melting point. (1M) (b) Carbon cannot reduce the oxides of sodium, magnesium, and aluminium because the reactivity of these elements is more than carbon so carbon can not reduce these highly reactive elements. (1M	
22	(i)Voltage reading is the same on voltmeter 1 and 2 as they are connected in parallel. (ii) Bulb 3 and 4 (don't award marks if both the bulbs are not mentioned)	1+1
23	(a)2 Glomerulus, and 3 Bowman's capsule. (b)Kidney → Ureter → Urinary bladder → Urethra	1+1
24	The aldehyde and ketone represented by the molecular formula, C3H6O.  Aldehyde (Propanal) Ketone (Propanone) [1M (structure) + 1M (name of the compound)]	2
25	a. The bulb will glow in both the circuits as the circuit will be closed. b. Changing the bulb will be dangerous for Madhu Reason: bulb is still connected to live wire even in open position	1+1
26	(a)Refractive index of the medium with respect to air = Speed of light in first medium (air) ÷ Speed of light in second medium or, $_2n_1 = x \div x/2 = x*2/x = 2 \Rightarrow {}_2n_1 = 2$ Hence, the refractive index of the medium with respect to air is 2  (b) OR Magnification of - 0.5 means that image formed is real, inverted and diminished one. It is possible only if the lens is a converging (convex) lens.	1+1



Section-C

Question No. 27 to 33 are short answer questions

27	(i) Step 1: Identify Compound X Compound X is an aqueous solution of sodium chloride (NaCl), commonly known as brine. (0.5 M) Step 2: Identify Gas Y Gas Y is hydrogen (H_2), which is liberated at the cathode during the electrolysis of sodium chloride solution. (0.5M) Step 3: Identify Gas Z Gas Z is chlorine (Cl_2), which is liberated at the anode during the electrolysis of sodium chloride solution. (0.5 M) Step 4: Identify Compound B Compound B is calcium oxy chloride ($CaOCl_2$), formed when chlorine (Cl_2) reacts with dry slaked lime. (0.5 M) (ii) Acidic salts are salts whose aqueous solutions are distinctly acidic in character. They are mostly salts of strong acids and weak bases. (0.5 M) Examples: Weak Base + strong Acid $NH_4OH + HCl$ —----------->NH_4Cl (any example of this combination) (0.5 M)	2+1
28	(i) Ore A gives CO_2 on heating; so, it is a carbonate ore The process involved in the Extraction of ore A a) Calcination- Ore is heated in a very low supply of air to obtain a metal oxide. $ACO_3 \rightarrow AO + CO_2g)$ (0.5 M) b)Reduction- If the metal oxide is reduced with coke to form metal atoms. $AO + C \rightarrow A(s) + CO(g)$ (0.5 M) So, Ore B is a sulphide ore. The process involved in the extraction of element B is- a) Roasting-Ore is heated in the presence of the atmosphere to obtain a metal oxide $2BS + 3O_2(g) \rightarrow 2BO + 2SO_2$ (0.5 M) b) Reduction-The metal oxide is reduced to metal atom by carbon $BO + C \rightarrow B(s) + CO$ (0.5M) (ii)  (1M)	2+1
29	(a) | | TP | Tp | tP | tp | | TP | TTPP | TTPp | TtPP | TtPp |	2+1

	a <table><tr><td>Tp</td><td>TTPp</td><td>TTpp</td><td>TtPp</td><td>Ttpp</td></tr><tr><td>tP</td><td>TtPP</td><td>TtPp</td><td>ttPP</td><td>ttPp</td></tr><tr><td>tp</td><td>TtPp</td><td>Ttpp</td><td>ttPp</td><td>ttpp</td></tr></table> (b)The probability of obtaining tall plants with white flowers is 3/16	
30	a. A- Tricuspid/Mitral valve, B- Pulmonary vein (b) Left ventricle needs to pump blood to the entire body, requiring more force during contraction. ○ Left ventricle faces higher pressure and workload. ○ It pumps blood to distant locations, while the right ventricle only pumps blood to the nearby lungs. (Any one) (c) The cavity "C", Left ventricle contains oxygenated blood. **OR** a. Doctors inject medicines in veins because veins are superficial and are easily locatable, secondly medicines need to be transported to all parts of the body through vein medicines reaching the heart and from heart it is pumped to all parts of the body. (b)The platelets are responsible for formation of clot in blood when it comes in contact with air. So, this prevents excess bleeding from the injury as it plugs the skin opening by clot formation on it. If there are no platelets in the blood, then we may die from a small injury due to excess bleeding as there will be no clotting to plug it.	3
31	(a)Grass → Insect → Frog →Snake → Hawk (b)1,00,000 J for insects, and 1000 J for Snakes.	1+2
32	A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid  	1+1+1

33	$\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$ $\frac{1}{v}=\frac{1}{f}-\frac{1}{u}$ $\frac{1}{v}=\frac{1}{15}-\frac{1}{-12}$ $\frac{1}{v}=\frac{1}{15}+\frac{1}{12}$ $\frac{1}{v}=\frac{4+5}{60}$ $\frac{1}{v}=\frac{9}{60}$ $v=\frac{60}{9}$ $\therefore v = 6.67$ cm Hence, the image of the needle is 6.67 cm away from the mirror. Also, it is on the other side of the mirror. $m=\frac{h_2}{h_1}=-\frac{v}{u}$ $\therefore h_2=-\frac{v}{u}\times h_1$ $=-\frac{6.67}{-12}\times 4.5$ $= +2.5$ cm	0.5 1 0.5 0.5 0.5
	Section-D **Question No. 34 to 36 are long answer questions**	
34	a. P-Ethanol, (1M) b. as a solvent for resins, fats and oils (any related examples) (1M) (c) CH_3CH_2OH + Acidified $K_2Cr_2O_7$ ⟶ CH_3COOH (Q) (1M) (d) $2CH_3COOH + 2Na \rightarrow 2CH_3COONa + H_2$ (1M) (e) Acids react with alcohol to form esters and it is known as esterification reaction. $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O$ (1M) Or a. Y- Ethanoic acid CH_3COOH (1M) b. Gas 'W' is bubbled through lime water it changes the colour of lime water to cloudy white which is commonly said milky. 1M) c. CH_3CH_2OH + Acidified $K_2Cr_2O_7$ ⟶ CH_3COOH (Y) (1M) $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5$ (Z) + H_2O (1M) Acids react with alcohol to form esters and it is known as esterification reaction. (1M)	5
35	(a)Joule's law of heating states that power of heating generated by an electrical conductor is proportional to the product of its resistance (R) and square of the electric current passing through the conductor with time	1

Let I be the current through the bulb and R be the resistance.

We know that,

P = V * I

I = P / V

= 40 / 220

= 0.18 A 1

We know that resistance is given as

R = V 2 / P

= (220) 2 / 40 1

= **1210 ohm.**

Therefore,

- The current drawn by the bulb = **0.18 A**

(b)

Case 2:

Given,

- Power, P = 25 W
- Potential difference, V = 220 V

Let I be the current through the bulb and R be the resistance.

We know that,

P = V * I

I = P / V

= 25 / 220

= 0.113 A 1

We know that resistance is given as

R = V 2 / P

= (220) 2 / 25

= **1936 ohm.**

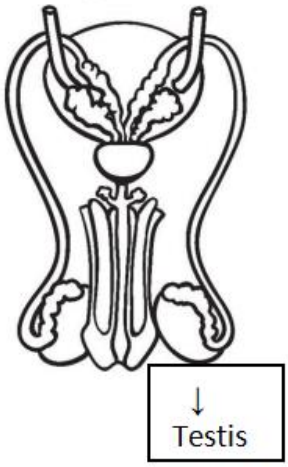
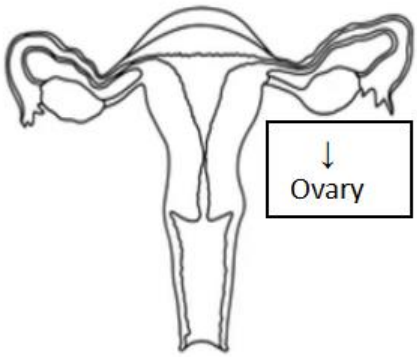
Therefore, 1

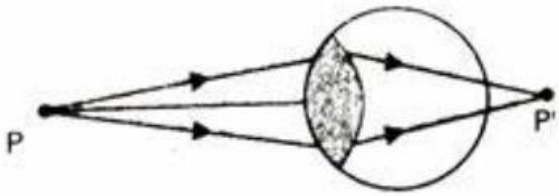
- The current drawn by the bulb = **0.113 A**
- The resistance of the bulb = **1936 ohm**

Thus, there is a change in the value of current and resistance in the two cases.

The **current in case 1 is more** since its **resistance is lesser** than the resistance of case 2.

OR

	(a) Since two $8\ \Omega$ resistors are in parallel, their effective resistance (R_p) is given by $\frac{1}{R_p} = \frac{1}{8} + \frac{1}{8} = \frac{1}{4}$ or $R_p = 4\ \Omega$ (b) Total resistance in the circuit, $R = 4\ \Omega + R_p = 4\ \Omega + 4\ \Omega = 8\ \Omega$ Current through the electric circuit, $I = \frac{V}{R} = \frac{8V}{8\ \Omega} = 1A$ Since $4\ \Omega$ resistor and R_p are in series, current through $4\ \Omega$ resistors $= 1A$ (c) pd across $4\ \Omega$ resistors, $V = IR = 1 \times 4 = 4V$ (d) Power dissipated in $4\ \Omega$ resistors, $P = I^2R = (1A)^2(4\ \Omega) = 4W$ (e) There is no difference in the readings of ammeters A_1 and A_2 as same current flows through all elements in a series curcuit.	1 1 1 1 1
36	(a). (i) A- Pollen grain, B- Pollen tube, C- Embryo sac/Ovule. Ovule/Embryo sac turns into seed after fertilisation. (ii) The second male gamete fuses with the polar nuclei to form endosperm. (b) Primary endosperm nucleus (**3n**) Nourishes the embryo whereas Zygote (**2n**) forms the embryo. OR (i) X – chromosomes Y – nucleus / nuclear membrane  (ii)  (Any one diagram)	5 (2+1 +2) OR (2+3)
	Section – E **Question No. 37 to 39 are case-based/data -based questions**	
37	(i) B is the most reactive metal because it displaces the iron from its solution, which is the most reactive of all the elements.	4

	(ii) It is clear that B is more reactive than iron, and since copper is less reactive than iron, B can displace copper from CuSO4 . (iii) The decreasing order of reactivity is B > A > C > D. (iv) Metal D can be used to make containers because out of all four elements, it is the least reactive. Also, it shows no displacement reactions with both zinc sulphate solution and silver nitrate solution.	
38	i) Generally, there are 6 types of tropism namely phototropism, gravitropism, chemotropism, thigmotropism, thermotropism and hydrotropism. ii) It is an example of thigmotropism. iii) Growth of pollen tubes towards an ovule is one example of chemotropism iv) Cytokinin promote cell division in plants.	
39	Study the diagram given below and answer the following questions.  (i)Hypermetropia (ii) The focal length of the eye lens is too long, and the eyeball has become too small (iii)Using a convex lens of suitable power (iv) The SI unit of power of a lens is 'dioptre'. It is denoted by the letter D. If f is expressed in metres, then, power is expressed in dioptres. Thus, 1 dioptre is the power of a lens whose focal length is 1 metre.	

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