EXAMINATION, 2025

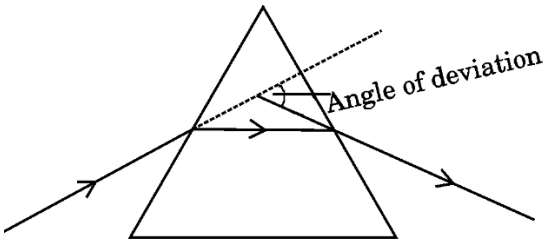
SOLUTIONS

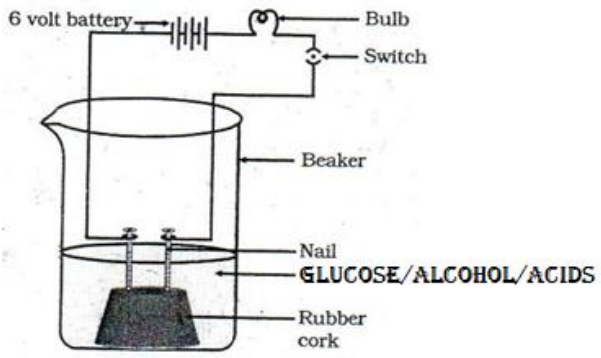
CLASS: X [SCIENCE (Subject Code–086)]

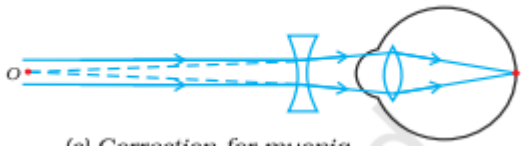
[Paper Code:30/3/3]

Maximum Marks: 80

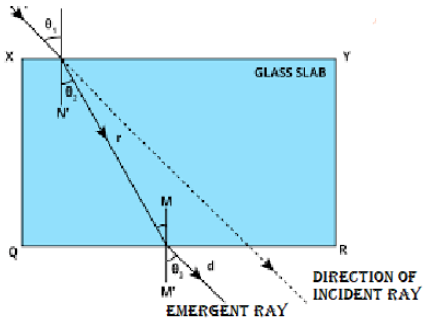
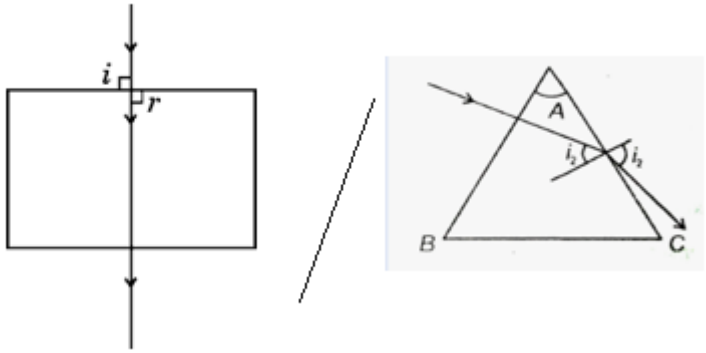
Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(A) / Reduction with carbon	1	1
2	(C) / 2, 3, 1, 3	1	1
3	(C) /(ii) and (iii)	1	1
4	(D) / It is an addition reaction which occurs in the presence of an acid catalyst.	1	1
5	(B) / $K_2SO_4, Na_2SO_4, CaSO_4$	1	1
6	(B) / *Hibiscus* and mustard	1	1
7	(D) / Chemotropism	1	1
8	(D) / a-(iii), b-(ii), c-(i), d-(iv)	1	1
9	(B) / Cytokinins	1	1
10	(C) / *Cuscuta*	1	1
11	(D) / Behind the mirror at a distance $\frac{f}{2}$	1	1
12	(C) / When sunlight passes through the fine particles in air, they scatter the blue colour of visible light more strongly than red.	1	1
13	(B) / Red for live wire, black for neutral wire and green for earth wire	1	1
14	(D) / Radius of the coil of the solenoid	1	1
15	(D) /The direction of magnetic field lines inside a bar magnet is from its north pole to its south pole.	1	1
16	(D) /(ii) and (iv)	1	1
17	(D)/ Assertion (A) is false, but Reason (R) is true.	1	1
18	(A) /Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
19	(B) / Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of Assertion (A).	1	1
20	(B) / Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of Assertion (A).	1	1
	SECTION B		
21	(a)Heat, light, electricity $2\,AgBr(s) \xrightarrow{Sunlight} 2\,Ag(s) + Br_2(g)$ (or any other example or statement) **OR** (b) Observation: Water droplets on upper part of the test tube/Colour changes from green to white/White to brown on heating strongly/Pungent smell of burning Sulphur. $Fe\,SO_4.7H_2O \rightarrow FeSO_4 + 7H_2O$ $2FeSO_4 \xrightarrow{Heat} Fe_2O_3 + SO_3 + SO_2$	1 1 ½ ½ 1	2

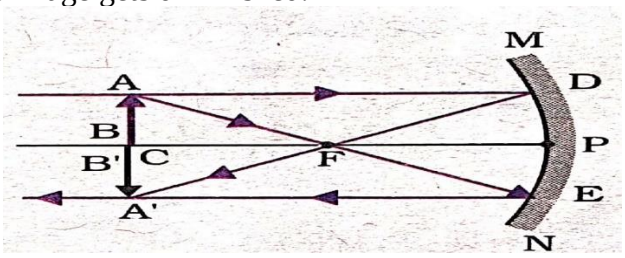
22	• Bleaching powder/Calcium oxychloride • $CaOCl_2$ • By the action of chlorine on dry slaked lime. • $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$	½ ½ ½ ½	2
23	• Veins carry deoxygenated blood from different organs and bring it back to the heart. • Because blood flows at low pressure inside veins.	1 1	2
24	Males have sex chromosomes XY while females have XX. If the male gamete with X chromosome fuses with the female gamete, then the offspring will be a female child and if the male gamete with Y chromosome fuses with the female gamete, then the offspring will be a male child. Hence, the sex of a child/ children will be determined by the chromosome inherited from the father. (Award marks if flow chart is drawn)	2	2
25	(a) Hypermetropia /Farsightedness/Longsightedness. Reasons: (i) Focal length of the eye lens is too long (ii) Eyeball becomes too small. Correction Convex lens /Converging lens **OR** (b)  DIAGRAM DIRECTION OF RAYS MARKING OF ANGLE	½ ½ ½ ½ 1 ½ ½	2
26	Between A and B, 3 resistors in series = AD + DC + CB in one branch Equivalent resistance, $R_S = 2\ \Omega + 2\ \Omega + 2\ \Omega = 6\ \Omega$ Now one resistor in arm AD is in parallel combination with the other three. Two branches: $R_1 = 2\ \Omega$ Rs = 6 Ω	½ ½	

	$\therefore \frac{1}{R_p} = \frac{1}{6} + \frac{1}{2} = \frac{1+3}{6} = \frac{4}{6}$ $R_p = \frac{6}{4} = 1{\cdot}5\ \Omega$	½ ½	 2
	SECTION C		
27	• Reddish brown to black • Oxidation/Redox reaction • $2\,Cu + O_2 \xrightarrow{Heat} 2\,CuO$ • Corrosion occurs in open air whereas oxidation occurs on heating. • Basic copper carbonate / $Cu(OH)_2.CuCO_3$ • Green	½ ½ ½ ½ ½ ½	 3
28	(a)(i) Electricity is passed through an aqueous solution of NaCl (brine), it decomposes to form NaOH. / Chlor-Alkali Process $2\,NaCl(aq) + 2\,H_2O \longrightarrow 2\,NaOH(aq) + Cl_2 + H_2$ (ii)When brine reacts with carbon dioxide and ammonia, sodium hydrogen carbonate and ammonium chloride are formed $2\,NaCl + H_2O + CO_2 + NH_3 \longrightarrow NaHCO_3 + NH_4Cl$ (b) **OR**  Bulb does not glow when solution of alcohol and glucose are taken but glows when acidic solution are taken. (Award marks if explained in words) **Reason:-** Acidic solutions liberate ions but glucose and alcohol do not liberate ions .Hence bulb only glows for acidic solutions..	½ 1 ½ 1 2 1	 3

29	• Blood flows twice in the heart before it completes one complete round of the body. Lungs → Pulmonary vein → Left atrium → Left Ventricle ↑ Right Ventricle (Oxygenated Blood) ↓ ↑ Right Atrium ↑ Vena cava ← Veins ← Body Parts ← Aorta (Deoxygenated blood)	1 2	3
30	(a)Round, yellow (b) round yellow : 9 round green : 3 wrinkled yellow : 3 wrinkled green : 1 (c)Traits are inherited independently/Independent assortment of the traits.	1 1 1	3
31	• Myopia /Shortsightedness Causes : (i) Excessive curvature of the eye lens (ii) Elongation of the eye ball • Diverging lens/concave lens • 	½ ½ ½ ½ 1	3
32	(a) Fleming's Left hand rule Statement : Stretch the thumb, fore figure and the middle figure of your left hand such that they are mutually perpendicular. If the first finger points in the direction of field (F) and the second finger in the direction of current, then the thumb will point in the direction of the force acting on the conductor. (b) (i) Maximum in Case III – Magnetic field and current/motion of charge are perpendicular to each other.	½ ½ ½ ½	

	(ii) Minimum in Case I – Magnetic field and current/motion of charge are parallel to each other.	½ ½	3
33	(a) • The energy captured by plants does not revert to solar input and the energy which passes to the herbivores does not come back to autotrophs. • As energy moves progressively through the various trophic levels it is no longer available to the previous level. • The energy available at each trophic level gets diminished progressively due to loss of energy at each level. **(ANY TWO)** (b) 100 J • Autotrophs ⟶ Primary consumer ⟶ Secondary Consumer 10000 J (1000 J) (100 J) /Only 10% energy of the organic matter of previous trophic level is transferred to next trophic level. /10% law	1x2 ½ ½	3
	SECTION D		
34	(a) (i) (I) Ag, (II) Al, (III) K, (IV) Cu (ii) Metal oxides which react with both acids as well as bases to produce salts and water are called amphoteric oxides. $Al_2O_3 + 6\,HCl \longrightarrow 2\,AlCl_3 + 3\,H_2O$ $Al_2O_3 + 2\,NaOH \longrightarrow 2\,NaAlO_2 + H_2O$ (Do not deduct marks if equation is not balanced) (iii) Water soluble bases are called Alkalis. NaOH / KOH (Sodium Hydroxide) / (Potassium Hydroxide) **(any one)** OR (b) (i) (I) $2\,HgS(s) + 3\,O_2(g) \xrightarrow{Heat} 2\,HgO(s) + 2\,SO_2(s)$ (cinnabar) $2\,HgO(s) \xrightarrow{Heat} 2\,Hg(l) + O_2(g)$ (II) $2\,CuS + 3\,O_2(g) \xrightarrow{Heat} 2\,Cu_2O(s) + 2\,SO_2(g)$	½ ½ ½ ½ 1 ½ ½ ½ ½ 1 1 1	

	$2\,Cu_2O + Cu_2S \xrightarrow{Heat} 6\,Cu(s) + SO_2(g)$ (Deduct half mark each for unbalanced equation) (ii) (I) Silver sulphide /Ag_2S (II) Basic Copper carbonate/$Cu(OH)_2$. $CuCO_3$	1 ½ ½	5
35	(a) (i) The extent of bending of the ray of light at the opposite parallel faces of the rectangular glass slab is equal and opposite. This is why the ray emerges parallel to the incident ray.  NORMAL INCIDENCE  (ii) u = – 30 cm , f = – 20 cm $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ or $\frac{1}{v} = \frac{1}{u} + \frac{1}{f}$ $\frac{1}{v} = \frac{1}{-30\text{ cm}} + \frac{1}{-20\text{ cm}}$ $= \frac{1}{-12\text{ cm}}$ or v= – 12 cm The image is at – 12 cm on the same side of the lens. **OR** (b) (i) Type of Image Real and Inverted (when candle is beyond F)/ Virtual and Erect (when candle is between P and F)	1 1 1 ½ ½ 1 1	

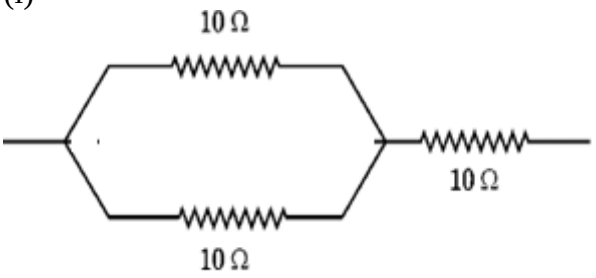
	As the object is moved gradually away from the pole of the mirror, the image gets diminished.  (ii) Object distance, u = – 6·00 m Image distance, v = ? Focal length, f = 3·00 m $\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$ or $\frac{1}{v}=\frac{1}{f}-\frac{1}{u}$ $\frac{1}{v}=\frac{1}{+3\cdot00\text{ m}}-\frac{1}{(-6\cdot00\text{ m})}$ $=\frac{1}{+3\cdot00\text{ m}}+\frac{1}{6\cdot00\text{ m}}=\frac{2+1}{6\text{ m}}$ or $v=\frac{6}{3}=2\cdot0\text{ m}$	1 1 ½ ½ ½ ½	5
36	(a) (i) 'X' – Stigma 'Y' – Anther (ii) Pollen grains (iii) Pollination (iv)After the transfer of pollen grains from anther into stigma, a pollen tube grows out of the pollen grain and travels through the style to reach the ovary. Male germ cell fuses with the female germ cell to form a zygote which divides several times to form an embryo within the ovule. The ovule develops a tough coat and is gradually converted into a seed. **OR** (b) (i)Binary fission (ii) *Leishmania* (iii) Produces a greater number offsprings within a short period of time /Ensures better chances of survival of organisms in unfavorable conditions/ formation of genetically similar organisms /gamete formation is not required. **(any two)** (iv) Budding A bud develops as an outgrowth due to repeated cell division at on specific site, develop into tiny individuals, and after being matured, detach from parent body and become new independent individuals. (Award marks if explained through labelled diagram) (or any other mode of reproduction)	½+ ½ 1 1 2 ½ ½ 1+1 1 1	5

SECTION E

37 (a) Graph A — 1

(b) Graph D — 1

(c) (i)



1

$$R = \frac{R_1 R_2}{R_1 + R_2} + R_3$$ — ½

$$R = \left(\frac{10 \times 10}{10 + 10} + 10\right)\Omega = 5\ \Omega + 10\ \Omega = 15\ \Omega$$ — ½

OR

(c)

(ii) • $I = \frac{V}{R} = \frac{6\ V}{(0{\cdot}1 + 0{\cdot}2 + 0{\cdot}3 + 0{\cdot}4 + 0{\cdot}5)\ \Omega} = \frac{6\ V}{1.5\ \Omega} =$ 4·0A — 1

• same current flows when resistors are connected in series. — 1

4

38 (a) (III)/ Tubewell water+ Solution of Salt A — 1

(b)

Salt A	Salt B
Soap	Detergent
Na/K salt of long chain carboxylic acids	sodium salt of sulphonic acids or ammonium salts with chloride or bromide ions.
Does not form lather with hard water	Forms lather even with hard water

1

(Any one)

(c)(i)

- Esters are sweet smelling substances used in making perfumes and flavoring agents. / Formed when alcohol and carboxylic acid in presence of acid to form ester. — 1
- It is converted back to alcohol and a salt of carboxylic acid. — ½

$CH_3COOC_2H_5 + NaOH \longrightarrow C_2H_5OH + CH_3COONa$ — ½

OR

(c) (ii) • Presence of Ca and Mg salts in water — ½

	•Scum Soap reacts with calcium and magnesium salts to form Insoluble substance.	½ 1	 4
39	(a)(i) Adrenaline **OR** (ii) Adrenal Gland (b) Heart beat becomes faster to supply more oxygen to the muscles / blood supply to the digestive system is reduced / blood supply to the skin is reduced / blood is diverted to the skeletal muscles / breathing rate increases/increased contractions of diaphragm and rib muscles. (**Any two)** (c)Chemical signal – travel through bloodstream and reach a wide range of target cells across the body. Electrical signal – travels through a nerve cell. (**Any other)**	2 2 1 1	 4