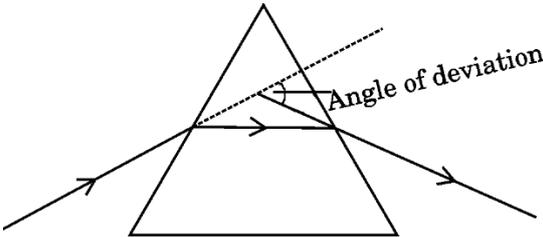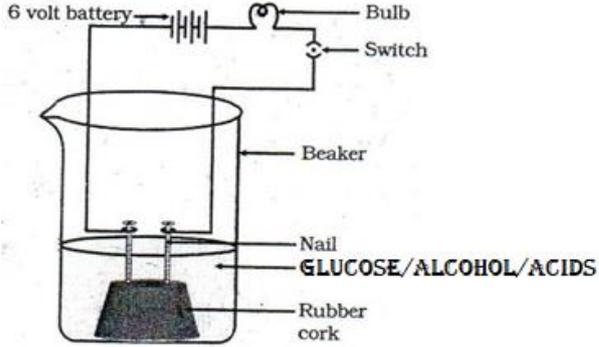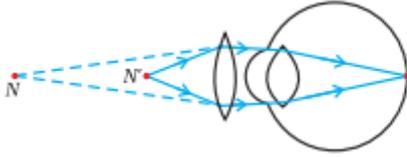# EXAMINATION, 2025
SOLUTIONS
CLASS: X [SCIENCE (Subject Code–086)]
[Paper Code: 31/3/2]

<div align="right">**Maximum Marks: 80**</div>

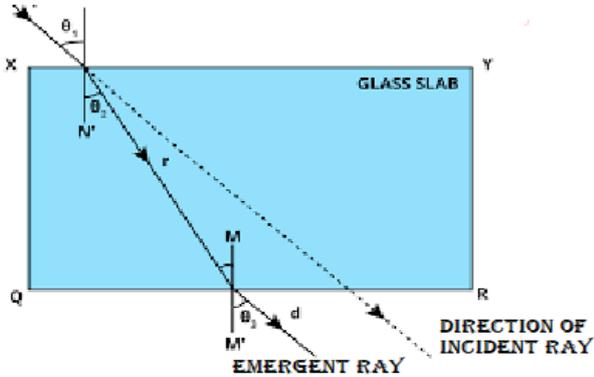| Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(C)/(ii)and(iii)	1	1
2	(D) / It is an addition reaction which occurs in the presence of an acid catalyst	1	1
3	(C) / 2, 3, 1, 3	1	1
4	(C) / (i) and (iv)	1	1
5	(B) / K_2SO_4, Na_2SO_4, $CaSO_4$	1	1
6	(D) / a-(iii), b-(ii), c-(i), d-(iv)	1	1
7	(D) / Medulla	1	1
8	(B) /*Hibiscus* and mustard	1	1
9	(B) /Cytokinins	1	1
10	(B) /*Amoeba*	1	1
11	(C) / 9R	1	1
12	(D) /The direction of magnetic field lines inside a bar magnet is from its north pole to its south pole.	1	1
13	**NOTE: - Full credit of one mark to all the students**.	1	1
14	(C) /Blue	1	1
15	(C) /Direction of current flowing through the coil of the solenoid	1	1
16	(D) /(ii) and (iv)	1	1
17	(B) /Both Assertion (A) and Reason (R) are true, but Reason (R) is *not* the correct explanation of Assertion (A).	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	(C) /Assertion (A) is true, but Reason (R) is false.	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	1	
	$$2\,AgBr(s) \xrightarrow{\text{Sunlight}} 2\,Ag(s) + Br_2(g)$$	1	
	(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.	½	
	$Fe\,SO_4.7H_2O \rightarrow \quad FeSO_4 + \quad 7H_2O$	½	
	$$2FeSO_4 \xrightarrow{\text{Heat}} Fe_2O_3 + SO_3 + SO_2$$	1	2

22	Baking powder contains mild edible acid like tartaric acid/liberates carbon dioxide easily/ neutralizes the sodium carbonate produced on heating baking soda/ removes the bitter taste / $NaHCO_3 + H^+ \rightarrow CO_2 + H_2O$ + Sodium salt of acid	2	2
23	• To carry oxygenated blood away from the heart to various organs of the body. • Because blood flows in Arteries under high pressure.	1 1	2
24	a) Plant height depends on the amount of plant hormone produced, synthesis of plant hormone depends on the efficiency of enzymes (proteins), whose synthesis depends upon the specific DNA sequence(gene). Lesser the hormone formed, shorter will be the height of the plant. (b)DNA/ Deoxyribonucleic acid/ Cellular DNA	½ x3 ½	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) Angle of deviation DIAGRAM DIRECTION OF RAYS MARKING OF ANGLE	½ ½ ½ ½ 1 ½ ½	2
26	Given I = 2 A, R = 40 Ω, t = 5 minutes = 300 s Electrical energy = I^2Rt	½	

29	$= (2A)^2 \times 40\ \Omega \times 300\ s$	1	
	$= 48000\ J$	½	2

SECTION C

|			
27	In a double displacement reaction, an exchange of ions takes place between the reactants whereas in a displacement reaction a more reactive element displaces a less reactive element from its compound.	1	
	• $Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2\ NaCl$ (Double displacement Reaction)	1	
	• $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$ (Displacement reaction) (Any other example)	1	3
28	(a) (i) Electricity is passed through an aqueous solution of NaCl (brine), it decomposes to form NaOH. / Chlor-Alkali Process	½	
	$2\ NaCl(aq) + 2\ H_2O \longrightarrow 2\ NaOH(aq) + Cl_2 + H_2$	1	
	(ii) When brine reacts with carbon dioxide and ammonia, sodium hydrogen carbonate and ammonium chloride are formed $2\ NaCl + H_2O + CO_2 + NH_3 \longrightarrow NaHCO_3 + NH_4Cl$	½ 1	
	(b) **OR** Bulb does not glow when solution of alcohol and glucose are taken but glows when acidic solutions are taken. (Award marks if explained in words) Reason:- Acidic solutions liberate ions but glucose and alcohol do not liberate ion .Hence bulb only glows for acidic solutions.	2 1	3
29	(a) Urea, Uric acid	½ x 2	

	(b) Glomerulus	1		
	(c) (Kidney) → Ureter → Urinary bladder → (Urethra)	½ x 2	3	
30	(a) Round, yellow	1		
	(b) round yellow : 9 round green : 3 wrinkled yellow : 3 wrinkled green : 1	1		
	(c) Traits are independently inherited/Independent assortment of the traits.	1	3	
31	• Hypermetropia/ far-sightedness	½		
	• (i) Focal length of the eye lens is too long (ii) Eye ball has become too small/shortened	½x2		
		1		
	• Convergent of light	½	3	
32	(a) •			
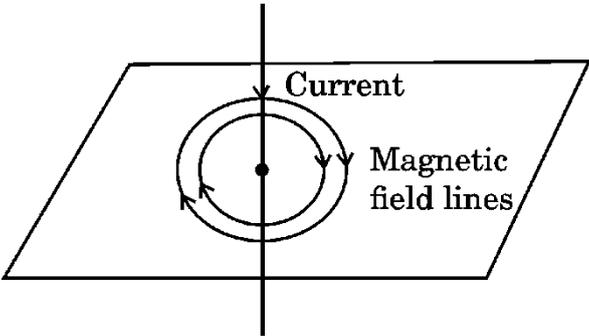
Diagram : 1

Labelling : 1 | 2 | | |
| | (b)   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 magnetic field lines. | 1 | 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)**	1x2	
	(b) 100 J • Autotrophs ⟶ Primary consumer ⟶ secondary consumer 10000 J (1000 J) (100 J) 	½ ½	
	/Only 10% energy of the organic matter of previous trophic level is transferred to next trophic level. /10% law		3

SECTION D

34	(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.	1	
		1	

NORMAL INCIDENCE

| | | 1 |
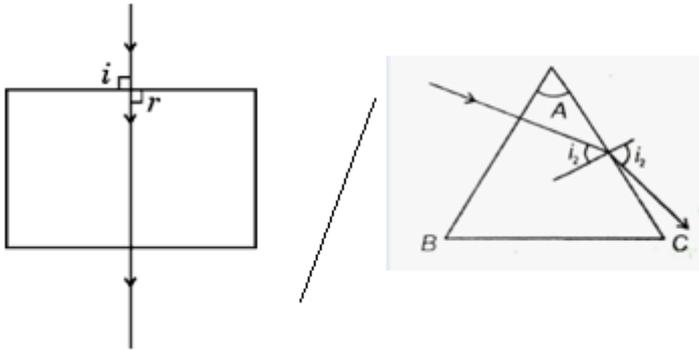
(ii) u = – 30 cm , f = – 20 cm

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \quad \text{or} \quad \frac{1}{v} = \frac{1}{u} + \frac{1}{f}$$

½

$$\frac{1}{v} = \frac{1}{-30 \text{ cm}} + \frac{1}{-20 \text{ cm}}$$

½

$$= \frac{1}{-12 \text{ cm}} \quad \text{or } V = -12 \text{ cm}$$

½

The image is at – 12 cm behind the lens.

½

(b)

(i)

Type of Image
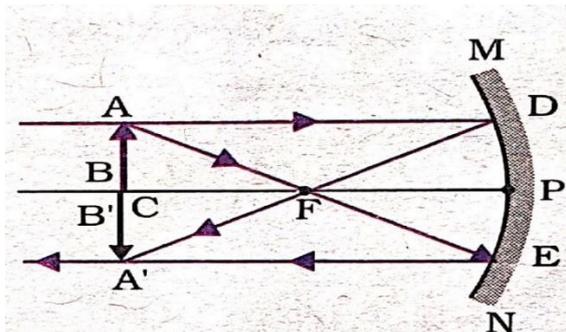
Real and Inverted (when candle is beyond F)/ Virtual and Erect (when candle is between P and F)

1

As the object is moved gradually away from the pole of the mirror, the image gets diminished

1

1
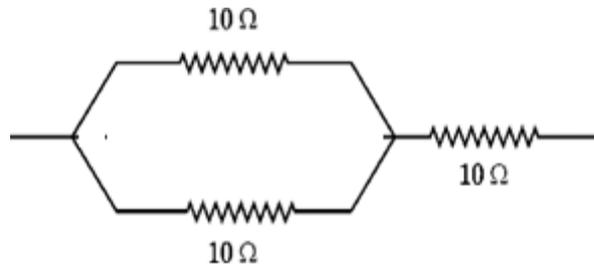
(ii) Object distance, u = – 6·00 m

Image distance, v = ?

Focal length, f = 3·00 m

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f} \quad \text{or} \quad \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

½

	$$\frac{1}{v} = \frac{1}{+3\cdot00\ m} - \frac{1}{(-6\cdot00\ m)}$$	½	
	$$= \frac{1}{+3\cdot00\ m} + \frac{1}{6\cdot00\ m} = \frac{2+1}{6\ m}$$	½	
	$$\text{or } v = \frac{6}{3} = 2\cdot0\ m$$	½	5
35	(a) (i) (I) Ag,	½	
	(II) Al,	½	
	(III) K,	½	
	(IV) Cu	½	
	(ii) Metal oxides which react with both acids as well as bases to produce salts and water are called amphoteric oxides.	1	
	$$Al_2O_3 + 6\ HCl \longrightarrow 2\ AlCl_3 + 3\ H_2O$$	½	
	$$Al_2O_3 + 2\ NaOH \longrightarrow 2\ NaAlO_2 + H_2O$$	½	
	(Do not deduct marks if equation is not balanced)		
	(iii) Water soluble bases are called Alkalis.	½	
	NaOH/KOH	½	
	Sodium Hydroxide / Potassium Hydroxide		
	(any one)		
	OR		
	(b) (i)		
	(I)		
	$$2\ HgS(s) + 3\ O_2(g) \xrightarrow{\text{Heat}} 2\ HgO(s) + 2\ SO_2(s)$$ (cinnabar)	1	
	$$2\ HgO(s) \xrightarrow{\text{Heat}} 2\ Hg(l) + O_2(g)$$	1	
	(II)		
	$$2\ CuS + 3\ O_2(g) \xrightarrow{\text{Heat}} 2\ Cu_2O(s) + 2\ SO_2(g)$$	1	
	$$2\ Cu_2O + Cu_2S \xrightarrow{\text{Heat}} 6\ Cu(s) + SO_2(g)$$	1	
	(Deduct half mark each for unbalanced equation)		
	(ii)		

	(I) Silver sulphide /Ag_2S (II) Basic Copper carbonate/$Cu(OH)_2. CuCO_3$	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.

<div align="center">OR</div>
(b)

(i) Binary fission
(ii) *Leishmania*

(iii) Produces a greater number of offsprings within a short period of time /ensures better chances of survival of species within a population/ production of large no. of offsprings with similar genetic structure or clones /no need for both male and female parents for fertilization. (any two)

(iv)

Budding

A bud develops as an outgrowth due to repeated cell division at a specific site, develop into tiny individuals, and after being matured, detach from parent body and become new independent individuals.   **(or any other)** | ½+½

1

1

2

½
½

1+1

1

1 | 5 |

<div align="center">SECTION E</div>

37	(a) (III)/ Tubewell water+ Solution of Salt A (b) 	Salt A	Salt B
Soap	Detergent
Na/K salt of long chain carboxylic acids	sodium salt of sulphonic acids or ammonium		1	

	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   ½
Soap reacts with calcium and magnesium salts to form insoluble substance .   1   4

38

(a)(i)Adrenaline   2

OR

(ii)Adrenal Gland   2

(b) Heart beat becomes faster / more supply of oxygen to the muscles / blood supply to the digestive system is reduced / blood supply to the skin is reduced / blood diverted to the skeletal muscles / breathing rate increases / increased alkalinity / increased sweating.   1

(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)   1   4

39

(a) Graph A   1

(b) Graph D   1

(c) (i)

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

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

OR

(c)

(ii) • $I = \dfrac{V}{R} = \dfrac{6\,V}{(0\cdot1 + 0\cdot2 + 0\cdot3 + 0\cdot4 + 0.5)\,\Omega} = \dfrac{6\,V}{1.5\,\Omega} = 4\cdot0\,A$

• same current flows when resistors are connected in series.

		1
	½	
	½	
	1	
	1	4