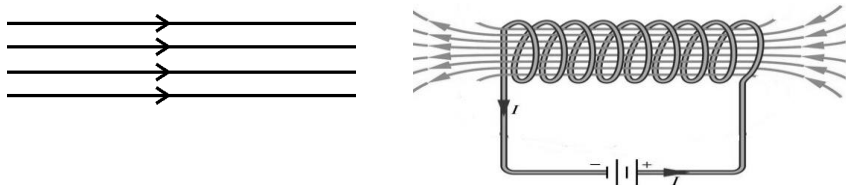# MARKING SCHEME
Secondary School Examination, 2024
SCIENCE (Subject Code–086)
[Paper Code: 31/5/1]

Maximum Marks: 80
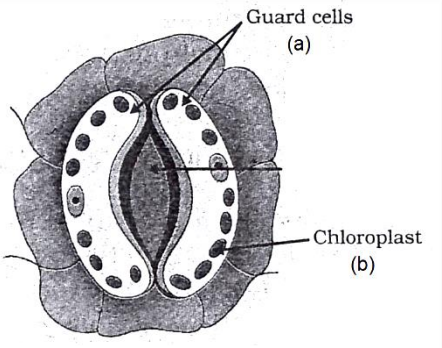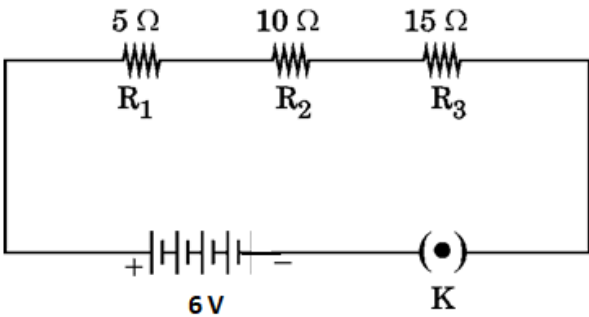
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(C) /2,2,4	1	1
2	(D) / $Fe_2O_3 + 3 CO \rightarrow 2 Fe + 3 CO_2$	1	1
3	(A) /Calcium Phosphate	1	1
4	(C)/ 7	1	1
5	(B) / Al, Al_2O_3	1	1
6	(D) / Translocation	1	1
7	(C)/ Receptors in skin →Sensory neuron →Relay neuron → Motor neuron→ Effector muscle in arm.	1	1
8	(A) / Nose	1	1
9	(C)/ It has a very small area for glucose and oxygen to pass from mother to the embryo	1	1
10	(A) / (i) and (ii)	1	1
11	(C) / The brightness of the image will reduce	1	1
12	(B) / Refraction, Dispersion and internal reflection	1	1
13	(A) / Red	1	1
14	(C) / A solenoid	1	1
15	(A) / both pointing into the plane of the paper.	1	1
16	(D)/ Crop land ecosystem	1	1
17	(A) / Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).	1	1
18	(D) / Assertion (A) is false, but Reason (R) is true.	1	1
19	(B) / Both Assertion (A) and Reason (R) are the true , but Reason (R) is not a correct explanation of Assertion (A).	1	1
20	(B) / Both Assertion (A) and Reason (R) are the true , but Reason (R) is not a correct explanation of Assertion (A).	1	1
	SECTION B		
21	(a) • Copper Oxide • Black $2Cu + O_2 \xrightarrow{\text{Heat}} 2CuO$ **OR** (b) $BaCl_2$ (aq)+ Na_2SO_4 (aq)$\rightarrow BaSO_4$ (s)+ 2NaCl (aq) Ba^{2+}, SO_4^{2-}	½ ½ 1 1 ½+½	 2

22	• Low melting points and boiling points – Weak intermolecular forces of attraction.	1	
	• Non-conductors of electricity – Bonding in these compounds does not give rise to any ions. / Covalent bonds or sharing of electrons do not form any charged particles.	1	
			2
23	(a)		
	• Formation of lactic acid in muscles causes cramps.	1	
	• Aerobic respiration takes place in the presence of oxygen whereas the respiration taking place above is due to lack of oxygen. / End products of aerobic respiration are CO_2 + H_2O + Energy whereas in the above case, Lactic acid + Energy is formed.	1	
	OR		
	(b)		
	• Tissue fluid / Extracellular fluid	1	
	Functions :		
	i. Carries digested and absorbed fats from the intestine.		
	ii. Drains excess fluid from extracellular space back into the blood.	½ + ½	
	iii. Fight against infections. **(Any two)**		
			2
24	• Plasmodium: Multiple fission- A single cell divides into many daughter cells simultaneously.	½ +½	
	• Leishmania: Binary fission- Splitting of one cell into two daughter cells in definite orientation.	½+½	
			2
25	(a) The sun light is converged at a point by convex lens which generates heat causing the paper to burn.	1	
	(b) •Principal Focus	½	
	•Real image of the Sun.	½	
			2
26	Q = I × t	½	
	$\therefore$ t = $\dfrac{500 \ C}{25 \ / \ 1000 \ A}$	½	
	= 20000 s	1	
			2
	SECTION C		
27	• Fe(s) + $CuSO_4$ (aq) $\rightarrow$ $FeSO_4$(aq) + Cu(s)	1	
	• Displacement reaction – A reaction in which a more reactive metal displaces a less reactive metal from its salt solution.	½ +½	
	• Zinc, Aluminium, Calcium, Magnesium **(Any two)**	½ ,+½	
			3

28	• Cinnabar • Sulphide ore • $2HgS + 3O_2 \xrightarrow{Heat} 2HgO + 2SO_2$ • $2HgO \xrightarrow{Heat} 2Hg + O_2$	½ ½ 1 1	
			3
29	(i) •Growth hormone •Secreted by pituitary gland. •It stimulates growth in all organs. (ii) •Thyroxin •Secreted by thyroid gland. •It regulates carbohydrate, protein and fat metabolism for body growth.	½ x 3 ½ x 3	
			3
30	(a) •All Plants Tall •Gene combination: Tt (b) It is a recessive trait / it cannot be expressed in presence of dominant trait. (c) Tall : Short 3:1 Conclusion: Tall trait is dominant and short trait is recessive.	½ ½ 1 ½ ½	
			3
31	(a) (i) • Hypermetropia • Ciliary muscles/ eye lens (ii) • Focal length of the eye lens is too long. • Eyeball becomes too small. (iii) Converging lenses/ convex lens They provide the additional focussing power required for forming the image on the retina./ Helps to decrease the focal length of the eye lens. **OR** (b) The splitting of white light into its constituent colours is called dispersion. Cause: Different colours of white light bend through different angles with respect to incident ray. 	½ ½ ½ ½ ½ ½ 1 1 1	
			3
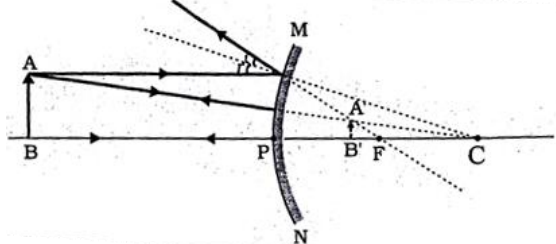
32	(a)		
	• It gets magnetised	½	
	• Electromagnet.	½	
	• It behaves as a magnet only when current passes through the solenoid.	½	
	(b)		
	(Any one diagram)	1	
	• This pattern indicates that the magnetic field is uniform.	½	
			3

33				
	Food chain	**Food web**		
	It is a series of organisms feeding on one another at various levels	It is a network of interconnected food chains / series of branching lines which provides a number of feeding connections amongst different organisms.	1+1	
	• Population of grass/ first trophic level will increase.		½	
	• Population of tiger/ third trophic level will decrease.		½	3

	SECTION D		
34	(a)		
	(i) The molecules of water of crystallisation in ferrous sulphate crystals get evaporated on heating.	1	
	(ii) Green $\longrightarrow$ White	½	
	(iii) Seven / ($FeSO_4 \cdot 7H_2O$)	½	
	(I) $CuSO_4 \cdot 5H_2O$	½	
	(II) $Na_2CO_3 \cdot 10H_2O$	½	
	(iv) • On heating gypsum ($CaSO_4 \cdot 2H_2O$) at 373 K it loses water molecules/ $CaSO_4 \cdot 2H_2O \xrightarrow[373\ K]{\Delta} CaSO_4 \cdot \frac{1}{2} H_2O + 1\frac{1}{2} H_2O$	1	
	Two uses of plaster of Paris:		
	• Making toys / material for decoration		
	• Supporting fractured bones **(or any other)**	½ + ½	

	OR		
	(b)		
	(i) X-Tartaric acid	½	
	Y-Baking soda	½	
	Z- Baking powder	½	
	Y- $NaHCO_3$	½	
	(ii)		
	$NaCl + H_2O + CO_2 + NH_3 \longrightarrow NH_4Cl + NaHCO_3$	1	
	$NaHCO_3 + H^+ \longrightarrow CO_2 + H_2O + \text{Sodium salt of acid}$	½	
	CO_2 released during heating makes the cake soft and spongy	½	
	(iii) Magnesium hydroxide; $Mg(OH)_2$	1	
			5
35	(a) • Take two healthy potted plants, A and B of nearly the same size. • Keep them in darkness for three days. (Destarch the plant) • Place a watch glass containing potassium hydroxide by the side of potted plant A but not in potted plant B. • Cover both the plants with separate bell jars and seal the bottom of the jars with Vaseline. • Keep both the plants in sunlight for two hours. • Pluck one leaf each from both the plants and test for the presence of starch with iodine solution.	½ x 6	
	• <u>Observation</u>: The leaf of the potted plant A with KOH did not turn blue – black. The leaf of the potted plant B turns blue.	1	
	• <u>Conclusion</u>: KOH absorbs CO_2 so photosynthesis did not occur in potted plant A.	1	
	OR		
	(b) (i) In set up (I) lime water turns milky in more time as compared to set up (II) because the air we exhaled contains high percentage of CO_2 as compared to atmospheric air.	1,1	

(ii)	 **Open Stomatal Pore**	1	
	Two labellings : (I) Guard Cells (II) Chloroplast Two functions performed by stomata : • Gaseous exchange • Transpiration	½ ½ ½ ½	5

36	(a)
	  (i) • Current becomes one-third of its initial value.
	     • Ohm's Law
	
	    The potential difference across the ends of a conductor is directly proportional to the current flowing through it, provided its temperature remains the same.
	
	  (ii)
	
	Total Voltage = V = 4 × 1·5 V = 6 V
	Total resistance, R(s) = R_1+ R_2 + R_3
	                     = 5 Ω + 10 Ω +15 Ω = 30 Ω
	(I) Current, I = $\dfrac{V}{R}$ = $\dfrac{6\ V}{30\ Ω}$ = 0·2 A
	(II) V = IR = 0·2 A × 10 Ω = 2 V
		½
		½
		
		1
		
		1
		
		1
		
		1	

OR
 	
(b)
  (i) When 1 joule of work is done to move a charge of 1 coulomb from one point to the other.
 	
  (ii) $d = 0.2 \text{ mm} = 2 \times 10^{-4} \text{ m}; \ R = 14 \ \Omega$
 	
$\rho = 1.6 \times 10^{-8} \ \Omega \text{ m}; \ A = \pi d^2 \big/ 4$
 	
$R = \dfrac{\rho l}{A} = \dfrac{4\rho l}{\pi d^2} \ \text{ or } \ l = \dfrac{\pi d^2 R}{4\rho}$
 	
$l = \dfrac{22}{7} \times \dfrac{(2 \times 10^{-4})^2}{4 \times 1.6 \times 10^{-8}} \times 14$
 	
$= 27.5 \text{ m}$
 	
When the diameter is doubled, d' = 2d
                        A' = 4A
 	
$\dfrac{R'}{R} = \dfrac{A}{A'} \ \text{ or } \ R' = \dfrac{RA}{A'} = \dfrac{RA}{4A}$
 	
$\dfrac{R'}{14} = \dfrac{A}{4A}$
 	
$R' = 3.5 \ \Omega$
 	
Change $(14.0 - 3.5) = 10.5 \ \Omega$
	1
	
	½
	
	½
	
	1
	
	½
	
	1
	
	½
		
		5

SECTION E		

37
 	
  (a) Compounds formed by carbon and hydrogen only.
  (b) Tetravalency and Catenation
  (c) (i) (1)   (2)
 	
                $-C\!\!\bigm<\substack{H\\\\O}$ $\overset{\displaystyle O}{\underset{}{\overset{\|}{-C-}}}$
 	
$CH_3COOH + C_2H_5OH \ \xrightarrow{\text{Acid}} \ CH_3COOC_2H_5 + H_2O$
                                         Ester
OR
(c)
(ii) Compounds with identical molecular formula but different structures
	1
	1
	
	½ + ½
	
	1
	
	1	

	Two isomers of butane C_4H_{10}	½ + ½	
			4
38	(a)

Self-pollination	Cross-pollination
Transfer of pollen grains from anther to the stigma of the same flower.	Transfer of pollen grains from the anther of one flower to the stigma of another flower.

(b) Petals, they dry and fall off.

(c)(i) Fusion of male and female gametes to form a zygote
    Ovule – Seed,
    Ovary – fruit

OR

(c) (ii) Future shoot – Plumule,
    Future root – Radicle
    Cotyledon – Stores food. | 1

½ + ½

1
½
½

½
½
1 | 4 |
| 39 | (a) It is straight line passing through the pole and centre of curvature of a concave mirror.
(b) Radius of curvature ,R= 20 cm

(c)
(i) $u = -10$ cm, $f = +15$ cm

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{15} - \frac{1}{-10}$$

$$\frac{1}{v} = \frac{1}{6}$$

$$\Rightarrow v = +6 \text{ cm}$$

OR

(c) (ii)   Convex mirror / Diverging mirror | 1

1

½
½

1

½ | |

[Note: Deduct ½ mark if direction of rays is not shown]

1 ½

4

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