MARKING SCHEME

Secondary School Examination, 2023

SCIENCE (Subject Code-086)

[Paper Code:31/6/1]

		Maximum Ma	rks: 80
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Mark
	SECTION -A		
1.	(b)	1	1
2.	(c)	1	1
3.	(b)	1	1
4.	(a)	1	1
5.	(b)	1	1
6.	(c)	1	1
7.	(a)	1	1
8.	(d)	1	1
9.	(c)	1	1
10.	(d)	1	1
11.	(b)	1	1
12.	(b)	1	1
13.	(b)	1	1
14.	(c)	1	1
15.	(d)	1	1
16.	(d)	1	1
17.	(d)	1	1
18.	(a)	1	1
19.	(c)	1	1
20.	(a)	1	1
	SECTION -B		
21.	Yes	1	

	1200	l is oxidised to Cl ₂ O, is reduced to MnCl ₂		1/2 1/2	2
22.	(a)	O ₂ is reduced to Miner ₂			
		Movement of Leaves of Sensitive plant	Movement of shoot towards light		
		It is not a growth related movement.	It is due to the growth in plant stem		
		Fast	Slow		
		Reversible response	Irreversible response		
		Non directional movement.	Directional movement.	1,1	
		Stimulus -touch	Stimulus -light	20720	
			or any other (any two)		
		At synapse the electrical signals	50 to 10 to	2	2
23.	Salivary amylase / Ptyalin – Enzyme.		1/2		
	Salivary gland		1/2		
	The	breakdown of starch into sugar	will not take place.	1	2
24.	• C	urrent becomes one fourth of its	original value.	1	
	pro		- potential difference is directly ng through the conductor provided	1	
	1	√ ∝ I (Temperature remaining c	onstant for a given conductor)		2
25.	(a)	Medium B		1/2	
		In medium B ray of light bends	towards normal /∠r < ∠i	V ₂	
	(b)	Refractive index of Medium 'B'	with respect of Medium 'A' is		
			$n_{BA} = \frac{v_a}{v_b}$	1	

	Angle of incidence Angle of refraction (Credit marks for ∠ i , ∠ r and arrows.)	1	
	(b) $n_{21} = \frac{n_{2a}}{n_{1a}}$	1/2	
	$\frac{1 \cdot 33}{2 \cdot 42} \text{or} 0.55$	1/2	2
26.	(a)Right-Hand Thumb Rule: Hold the current carrying conductor in right hand, such that thumb indicates direction of current, then the fingers will wrap around conductor in the direction of field lines of the magnetic field. Alternate answer of the statement	1	
	(b)Fleming's Left Hand Rule: Stretch the forefinger, middle finger, and thumb of the left hand such that they are mutually perpendicular to each other. If the forefinger indicates the direction of the magnetic field, the middle finger indicates the direction of current, then the thumb points in the direction of motion or force acting on the conductor. Alternate answer of the statement	1	

	All the physical quantities mentioned in the diagram are mutually perpendicular to each other.		2
	SECTION- C	8	
27.	Oxygen rich blood from the lungs comes to the left atrium of heart.	1/2	
	•It then contracts and the blood is transferred to left ventricle.	1/2	
	Left ventricle in turn contracts and the blood is pumped out to the body.	1/2	
	Deoxygenated blood from the body enters the right atrium.	1/2	
	On its contraction, blood enters into right ventricle	1/2	
	Right ventricle pumps it to the lungs for oxygenation	1/2	3
28.	(a) (i) Chemical Name : Calcium Carbonate	1/2	
	Chemical formula : CaCO ₃	1/2	
	(ii) • CaCO ₃ + 2HCl → CaCl ₂ + H ₂ O + CO ₂ ↑	1	
	• $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$	1	
	OR		
	(b) (i) Hydrogen / H ₂	1/2	
	(ii) The gas burns with a pop sound	1/2	
	(iii) (1) $2HCl + Zn \rightarrow ZnCl_2 + H_2$	1	
	$(2) 2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$	1	3
29.	(a) • ∧drenal gland ; ∧drenaline hormone	1/2 , 1/2	
	Response- Heart beats faster resulting in supply of more oxygen to muscles Breathing rate increases Blood supply to digestive system and skin gets reduced. Blood supply diverted to skeletal muscles. (any two)	1,1	
	OR		
	(b)		
	(i) A - Sensory neuron	1/2	
	B -Relay Neuron	1/2	
	C- Effector organ/Muscle	1/2	
	(ii) A- Carries impulse from receptor to spinal cord	1/2	
	C- Responds to stimulus	1/2	
	(iii) The thinking process of the brain is not fast enough / Reflex arcs are more efficient in functioning in the absence of true thought	1/2	
	processes		3

30.	(a) $CaO + H_2O \rightarrow Ca (OH)_2 + Heat$		
	(or any other reaction showing release or absorption of heat)	1	
	(b)		
	$Z_{n} + H_{2}SO_{4} \rightarrow Z_{n}SO_{4} + H_{2}(g) \uparrow$	1	
	(or any other)		
	(c)		
	$CuSO_4.5H_2O \xrightarrow{heat} CuSO_4 + 5H_2O$	1	
	(Blue) (White)		_
	(or any other)		3
31.	excessive curvature of the eye lens	½ ⅓	
	elongation of the eyeball	72	
	(a)		
	0	1	
	(b) Myopic Eye		
	(b)		
	0		
		1	
	(c) Correction for myopia		3
32.	A solenoid is a coil of many turns of insulated copper wires wrapped	1	
	closely in the shape of a cylinder	22	
	When electric current is passed through it	1	
	Magnetic field lines		
	Solemold		
	13333333	1	
	B Lat 1/2 and if the star of assessment as magnetic field is not		3
	(Deduct ½ mark if direction of current or magnetic field is not marked.)		3.
33.	(a) (i) 1%	1/2	
	(ii) 10% energy	1/2	
	(b) Every step of a food chain where transfer of energy occurs.	1	

	Since the amount and available energy keeps on becoming less as we move to higher trophic level, very little usable energy remains after four trophic levels.	1	3
	SECTION -D		
34.	(a) (i) A = CH ₃ COOH / (Ethanoic acid) / Acetic acid	1/2	
	Nature = acidic	1/2	
	Functional group = - COOH / (carboxylic acid)	1/2	
	$CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$	1	
	(ii) (1) B – Ethanol / Ethyl alcohol / C ₂ H ₅ OH	1/2	
	C – Ester / Ethyl ethanoate / Ethyl acetate	1/2	
	(2) Acid acts as a Catalyst in this reaction acid	1/2	
	(3) $CH_3COOH + C_2H_5OH \longrightarrow CH_3COOC_2H_5 + H_2O$	1	
	OR		
	(b) (i) Ethene/C ₂ H ₄	1/2	
	H H C H C H H H H	1	
	As a dehydrating agent	1/2	
	(ii) • The process in which unsaturated hydrocarbons/compounds react		
	with hydrogen in the presence of a catalyst (Ni / Pd) to give saturated hydrocarbon.	1	
	H H		
	$ \begin{array}{c cccc} R & & H & H \\ C & C & \frac{Ni \ catalyst}{H_2} & R - C - C - R \\ R & R & R \end{array} $	1	
	Used in the hydrogenation of vegetable oils which are converted into	1	1021
	fats with saturated carbon chains.	SE	5
35.	(a) As DNA is the information source for making proteins. If the		
	information is changed, different protein will be made and will lead to altered body design.	1	
	(b) In the absence of pollination no male gametes will be available for fertilisation.	1	
	(c) Because in many multi cellular organisms specialised cells are organised into tissues, tissues form organ occupying definite positions in the body.	1	

	 (d) 1. Plants can bear flowers and fruits earlier than those produced from seeds. 2. It enables the propagation of plants such as banana, orange, rose and jasmine which have lost the capacity to produce seeds. 3. The plants produced are genetically similar enough to the parent plant to have all the characteristics 	V ₂ , V ₂	
	(any one point)		
	(e) During gamete formation the number of chromosomes is reduced to		
	half. When the zygote is formed / at the time of fertilisation, fusion of		
	male and female gametes restores the original number of chromosomes	1	5
	in the offspring as in the parent.		
36.	(a) (i) The property of conductor to resist the flow of charges through it.	1	
	If Potential difference across the two ends of a conductor is 1V and the		
	current through it is 1A, then resistance 'R' of the conductor is 1Ω .	1	
		100	
	Alternate answer		
	$1\Omega = \frac{1 \text{ volt}}{1 \text{ ampere}}$		
	(ii)		
	Length of the conductor		
	Area of cross-section of the conductor		
	Nature of the material		
	• Temperature (any two)	1/2 + 1/2	
	(iii) (1) The resistance will become one half of its original value.		
	$R = \rho \frac{1}{\Delta} = \rho \frac{1}{\pi r^2}$	1/2	
	$R = \rho \frac{1}{A} = \rho \frac{1}{\pi r^2}$	72	
	$R' = \frac{\rho.2L}{\pi(2r)^2}$	1	
	(2)		
	$R' = \frac{\rho \cdot l}{\pi (2r)^2} \cdot \frac{2}{4} = \frac{R}{2}$	1/2	
	Resistance will reduce to one half.		
	OR		
	(b) (i) No	1	
	In series combination overall resistance will increase hence		
	decreasing the current . Potential difference also divides. Therefore		
		2.0	

		1	
brightness.			
(ii) None of the bulb glows in series broken and current stops flowing.	combination as the circuit gets	1	
		1	
			5
(a) By electrolytic reduction	440722	1	
	10 10 T (10 T) 10 10 10 10 10 10 10 10 10 10 10 10 10	1	
into mercuric oxide. / This is the	n reduced to mercury.	1	
	2SO ₂	1/2	
OR (c)			
Roasting	Calcination		
A process in which sulphide ores are converted into oxides by heating strongly in the presence of	A process in which carbonate ores are heated in limited supply air.		
excess air $2ZnS + 3O_2 \xrightarrow{\text{heat}} 2ZnO +$	$ZnCO_3 \xrightarrow{heat} ZnO + CO_2$	2	
[C	(or any other)		4
Gamete – 23 chromosomes.		1/ ₂ 1/ ₂	
(b) The temperature at which fertilised eggs are kept determines whether the animals developing in the eggs are male or female.			
	difference hence the required current brightness. (ii) None of the bulb glows in series broken and current stops flowing. In parallel combination the other two brightness as the same voltage is available series as the same voltage is available. SECTION (a) By electrolytic reduction (b) Carbon cannot reduce the oxides of these metals have more affinity for (c) When Cinnabar is heated in the present into mercuric oxide. It is the a standard of the series and the series are converted into oxides by the standard or series are conver	(ii) None of the bulb glows in series combination as the circuit gets broken and current stops flowing. In parallel combination the other two bulbs will glow with same brightness as the same voltage is available to them. SECTION- E (a) By electrolytic reduction (b) Carbon cannot reduce the oxides of highly reactive metals / these metals have more affinity for oxygen than carbon. (c) When Cinnabar is heated in the presence of air, it is first converted into mercuric oxide. / This is then reduced to mercury. 2HgS + 3O ₂ heat 2HgO + 2SO ₂ 2HgO DR (c) Roasting Calcination A process in which sulphide ores are converted into oxides by heating strongly in the presence of excess air 2ZnS + 3O ₂ heat 2ZnO + CO ₂ (a) Zygote - 23 pairs / 46 chromosomes. Gamete - 23 chromosomes. (b) The temperature at which fertilised eggs are kept determines whether	difference hence the required current and will glow with its normal brightness. (ii) None of the bulb glows in series combination as the circuit gets broken and current stops flowing. In parallel combination the other two bulbs will glow with same brightness as the same voltage is available to them. SECTION-E (a) By electrolytic reduction (b) Carbon cannot reduce the oxides of highly reactive metals / these metals have more affinity for oxygen than carbon. (c) When Cinnabar is heated in the presence of air, it is first converted into mercuric oxide. / This is then reduced to mercury. 2HgS + 3O ₂ heat

	Sex determination in Human beings PARENTS: FATHER MOTHER XY XX XX XX XX XX XX Y Y Y Y	2	
	(c) The 23 rd pair or the sex chromosome in human females contains 'XX' chromosome. At the time of gamete formation, each gamete gets one X-chromosome.	2	4
39.	(a) Real, inverted, diminished (Any two)	1/2 , 1/2	
	(b) Case II	1/2	
	Because focal length of mirror is 15 cm, object distance is 30cm which	1/2	
	means the object is placed at C.	1	
	(c) Dentists use concave mirrors		
	Because concave mirror forms erect and enlarged image when object is very close to the mirror.	1	
	OR		
		1	
	(c) Case III		
	E B'	1	
	(Deduct ½ mark if direction of ray is not marked.)		4

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