Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Supplementary Examination, July- 2023
SUBJECT NAME: SCIENCE SUBJECT CODE : 086 PAPER CODE : 31/C/1

General Instructions: -

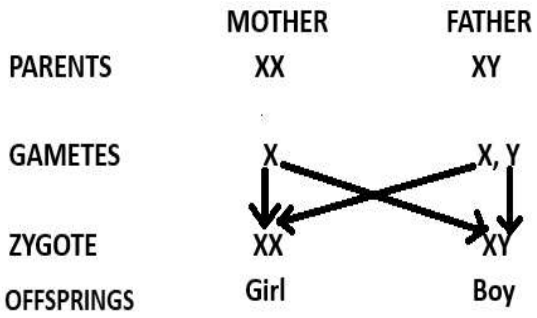
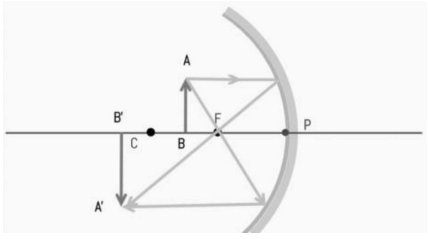
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	**"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc may invite action under various rules of the Board and IPC."**
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.**
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after delibration and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note

	"Extra Question".
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks _____80_____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. Wrong question wise totaling on the title page. ● Leaving answer or part thereof unassessed in an answer book. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
15	Any un assessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for spot Evaluation**" before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME
Secondary School Supplementary Examination, July - 2023
SCIENCE (Subject Code–086)
[Paper Code: 31/C/1]

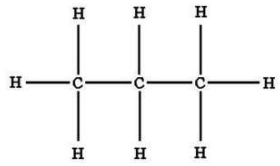
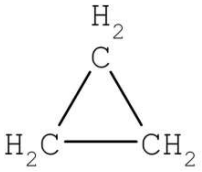
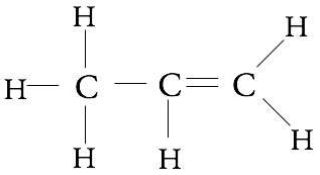
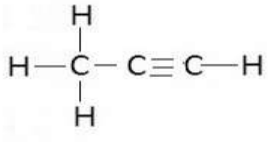
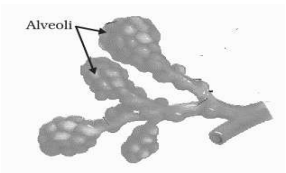
Maximum Marks : 80

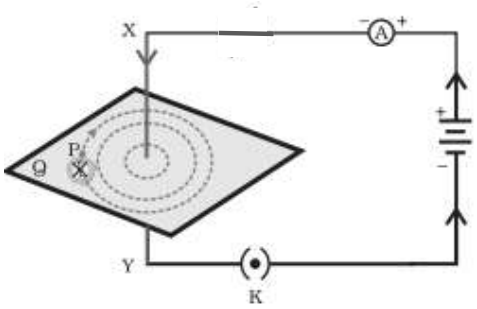
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1	(d)	1	1
2	(a) / (c)	1	1
3	(c)	1	1
4	(b)	1	1
5	(c)	1	1
6	(b)	1	1
7	(c)	1	1
8	(d)	1	1
9	(c)	1	1
10	(d)	1	1
11	(a)	1	1
12	(a)	1	1
13	(d)	1	1
14	(a)	1	1
15	(c)	1	1
16	(a)	1	1
17	(d)	1	1
18	(b)	1	1
19	(c)	1	1
20	(d)	1	1
	SECTION— B		
21	(a) A = Potassium / K **or** Sodium /Na B = Calcium / Ca **or** Magnesium / Mg C = Aluminium / Al **or** Iron / Fe **or** Zinc / Zn D = Lead / Pb **or** Copper / Cu **or** Silver / Ag **or** Gold / Au	½ ×4	

	OR		
	(b) (i) (1) Sodium chloride -yellow	½	
	(2) Calcium chloride – brick red	½	
	(credit full marks for any other colour)		
	(ii) No	½	
	Justification : Because they are ionic or electrovalent compounds which are insoluble in organic solvents	½	2
22	• Prostate gland, and seminal vesicles	½, ½	
	• 1) It provides nutrition to the sperms.	½	
	2) It makes the transport of sperms easier through the fluid medium.	½	2
23			
	Diagram	1	
	Labelling	1	
	(Award 1 mark if explained through words only)		2
24	(a) $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$	½	
	$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$		
	$= \frac{1}{-15} - \frac{1}{-20} = \frac{-1}{60}$		
	v = - 60 cm	½	
	m = $\frac{-v}{u}$	½	
	= - $\frac{-60}{-20}$ = -3	½	
	OR		
	(b) 		
	Diagram	1½	2
	Direction of the rays	½	

25	Short circuiting / fuse will blow or melt / break in circuit. (any one) Justification: $I = \frac{P}{V} = \frac{3000\ W}{220\ V} = 13.6\ A$ As the current rating is only 10 A and the oven draws a current of 13.6 A, which is more than the current rating. Hence the oven will stop working.	1 1	 2
26	(a) Cloth bag is biodegradable / eco-friendly. (b) i. segregation of biodegradable and non-biodegradable waste at source. ii. By composting iii. Recycling of solid wastes (any two) (any other suitable way)	1 ½+½	 2
	SECTION—C		
27	• The process in which plants/autotrophs take in substances from outside and convert them into stored form of energy. / The process in which CO_2 and water is converted into carbohydrates in the presence of sunlight and chlorophyll. / $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \underset{\text{(Glucose)}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$ • Chloroplast • leaves / green part of the plant. • water • stored as starch	 1 ½ ½ ½ ½	 3
28	(a) (i) 'X' is Ethanol / C_2H_5OH (ii) • $2C_2H_5OH + 2Na \longrightarrow 2C_2H_5O^-Na^+ + H_2$ $C_2H_5OH \xrightarrow[443K]{H_2SO_4(conc)} CH_2{=}CH_2 + H_2O$ (Do not deduct marks if equations are not balanced) • Sulphuric acid acts as a dehydrating agent. **OR** (b) (i) due to the formation of strong covalent bonds. (ii)	1 1 ½ ½ 1	

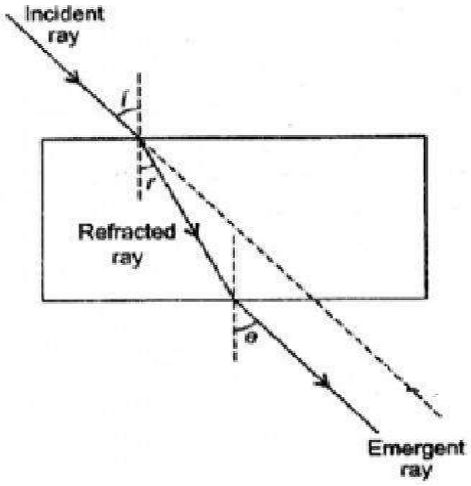
Saturated compounds	**Unsaturated compounds**
• Compounds containing	• Compounds containing carbon-

	carbon- carbon single bonds. | carbon double or triple bonds. (Any other difference) • Structure of saturated compound  /  • Structure of unsaturated compound  /  (any one in each)	1 ½ ½	3
29	(a) Within the lungs when the air passage divides into smaller and smaller tubes which finally terminate into balloon- like structures, these are called alveoli. /  Function – It provides a surface where the exchange of gases takes place. (b) It is the volume of air left in the lungs after exhalation.	1 1 1	3
30	• Exchange of gases through stomata. • By the process of respiration. • The guard cells absorb water and swell causing the stomatal pore to open. • The guard cells lose water and shrink and hence the pore closes.	½ ½ 1 1	3
31	• It is the phenomenon of scattering of light by the colloidal particles due to which the path of the light becomes visible. • Examples: 1. When sunlight passes through a canopy of dense forest. 2. A fine beam of sunlight enters a smoke/ dust filled dark room through a small hole. • Explanation: When a beam of light passes through a heterogenous mixture of minute particles (dust, smoke etc) it is reflected diffusely by the particles and gets scattered. This scattering of light makes the beam of light visible.	1 ½ ½ 1	3

32	(a) (i) Solenoid : A coil of many turns of insulated copper wire wrapped closely in the shape of cylinder. Circular coil : Straight wire bent in the form of circular loop with many turns. (ii) By taking a non-conducting cylindrical tube and winding a long, insulated copper wire tightly over it in the shape of a spring such that the turns are closely placed and lie side by side. (iii) To magnetise a piece of magnetic material like soft iron / To make an electromagnet (any one) **OR** (b) •  Diagram Labelling of magnetic field (Please check the direction of magnetic field lines corresponding to the direction of current in the conductor.) • 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 field lines of the magnetic field.	1 1 1 1 1 1	3
33	• Trophic level – Various steps or levels in a food chain • (i) secondary consumer – third trophic level. (ii) tertiary consumer – fourth trophic level. • 1. Death of all organisms at one trophic level will lead to ecological imbalance / disrupt the food chain. 2. Organisms of the next level will starve to death / enter other food chain / organisms of the previous level will multiply profusely / (any other)	1 ½ ½ ½ ½	3
	SECTION—D		
34	(a) (i) (2) Magnesium hydroxide (ii) (2) $Ca(OH)_2$ and (4) NaOH	1 ½+ ½	

	(iii) • NH_3 / Ammonia • NH_4OH / Ammonium hydroxide (iv) To neutralize the effect of acid in the bee sting. (v) (1) Oxalic acid (2) Tartaric acid **OR** (b)(i) It is the fixed number of water molecules present in one formula unit of salt. (ii) Hydrated copper sulphate / Copper sulphate penta hydrate. $CuSO_4.5H_2O$ (iii) • $CaOCl_2$ • Chemical equation $Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$ • Uses – 1. For bleaching cotton and linen in textile industry. 2. As an oxidising agent in a chemical industry. 3. For disinfecting water. (or any other)	½ ½ 1 ½+ ½ 1 ½ ½ ½ 1 ½ ×3	5
35	(a) (i) (1) Ovary (2) Oviduct / Fallopian tube (3) Lining of the uterus (ii) (1) zygote is formed (2) when egg is not fertilised, egg lives for about one day, the lining of the uterus slowly breaks down and comes out through vagina along with blood and mucous. **OR** (b) (i) (1) Unisexual flower – contains either stamens or pistil. eg: Papaya/ Water melon (any other) (2) Bisexual flower – contains both stamens and pistil eg: Hibiscus / mustard (any other) (ii) A – Pollen Grain B – Stigma C – Pollen tube D – Female germ-cell / egg cell (iii) Transfer of pollen is required for fusion of gametes. / Pollen needs to be transferred from the stamen to the stigma as it brings male germ-cell (Pollen) + female germ-cell (egg) together for fusion.	1 1 1 1 1 ½ ½ ½ ½ ½ ×4 1	5

36	(a) • kilowatt hour or kWh • 1 kWh = 1000W × 3600 seconds = 3.6 × 10^6 watt seconds 1 kWh = 3.6 × 10^6 Joule (b) P = 8 W ; V = 220 V ; Current rating = 1.0 A Current through each lamp = $\frac{8\,W}{220\,V}$ Number of lamp = $\frac{current\ rating}{current\ through\ each\ lamp}$ = $\frac{1.0A}{\frac{8W}{220\,V}}$ = $\frac{220}{8}$ = 27.75 So, 27 lamps can safely be used in the circuit.	1 ½ 1 1 ½ 1	5
	SECTION - E		
37	(a) • Middle • Sulphides /Carbonates/Oxide (any one) (b) ***Roasting*** / ***Calcination*** Ore is heated in excess of air. / Ore is heated in the absence or limited supply of air. This is used for sulphide ores. / This is used for carbonate ores. (Any one difference) (c) • Galvanization – coating of iron object with a thin layer of zinc. • Alloying – A mixture of two or more metals or a metal and a non-metal. (or any other) **OR** (c) The reaction between aluminium and iron oxide is highly exothermic which forms molten iron which is used in welding cracked machine parts. $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s) + Heat$	½ ½ 1 1 1 1 1	4
38	(a) • Bony box / Cranium, fluid filled balloon (b) • i. Sensory neuron – pass information from receptors to spinal cord. ii. Motor neuron – transmit information from spinal cord to effector organ / muscle. (c) (i) Cerebellum / Hind Brain – Voluntary Action (ii) Medulla / Hind Brain - Involuntary Action	½, ½ ½ ½ ½+ ½ ½+ ½	

	OR (c) Through Peripheral nervous system • Cranial nerves, and Spinal nerves	1 ½, ½	4
39	(a) The refractive index of a medium with respect to air or vacuum / Absolute refractive index of a medium = $\frac{\text{speed of light in air(vacuum)}}{\text{speed of light in medium}}$ (b) (i) speed of light is more in water (ii) bends away from normal (c) Absolute refractive index of a medium = $\frac{\text{speed of light in vacuum}}{\text{speed of light in medium}}$ $\frac{3}{2} = \frac{\text{speed of light in vacuum}}{2 \times 10^8}$ Speed of light in vacuum = 3×10^8 m/s Speed of light in water = $\frac{3}{4} \times 3 \times 10^8$ m/s $= \frac{9}{4} \times 10^8$ m/s **OR** (c)  Diagram Labelling	1 ½ ½ ½ ½ 1 1 1	4

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