Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Supplementary Examination, July 2024
SUBJECT NAME: SCIENCE **SUBJECT CODE: 086**
PAPER CODE: 31/B

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.

SECONDARY SCHOOL SUPPLEMENTARY EXAMINATION, July 2024

MARKING SCHEME

CLASS : X SCIENCE (Subject Code–086)

[Paper Code: 31/B]

Maximum Marks: 80

Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
1	(B)	1	1
2	(A)	1	1
3	(C)	1	1
4	(D)	1	1
5	(C)	1	1
6	(D)	1	1
7	(D)	1	1
8	(D)	1	1
9	(A)	1	1
10	(D)	1	1
11	(C)	1	1
12	(D)	1	1
13	(B)	1	1
14	(A)	1	1
15	(B)	1	1
16	(C)	1	1
17	(A)	1	1
18	(C)	1	1
19	(D)	1	1
20	(A) / (B) R-statement is right the explanation for only villi, but not for blood vessels.	1	1
	SECTION B		
21	Ozone shields the surface of the earth to protect from the harmful effects of the ultra violet radiations emitted from the sun. These radiations can cause skin cancer in human beings, damages to organisms.	2	2
22	(a) • Calcium sulphate hemihydrate • $CaSO_4.\frac{1}{2}H_2O$	 ½ ½	

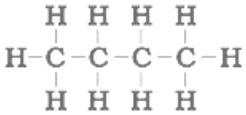
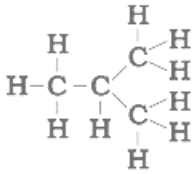
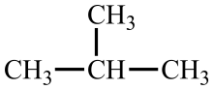
	• To prevent its reaction with moisture / from forming a hard mass (gypsum) **OR** (b) • The reaction between an acid and a base to form salt and water. • $NaOH + HCl \rightarrow NaCl + H_2O$ (Sodium chloride) / (salt) **(Or any other suitable reaction)**	1 1 1	2
23	(i) • Bile juice in small intestine converts acidic food of stomach into alkaline for the pancreatic enzyme to act • Bile salts allow breakdown/emulsification of large fat globules into smaller droplets. (ii)Role of pancreatic enzymes: • Digestion of proteins into amino acids. • Breaking down of emulsified fats into fatty acids and glycerol. (Any other suitable role)	½ ½ ½ ½	2
24	• Plant hormones: These are the chemical compounds in plants which help to coordinate growth, development, and responses to the environment. • (i) Auxin (ii) Cytokinin	1 ½ ½	2
25	(a) (i) Myopia (ii) • Excessive curvature of eye lens / Converging power of eye lens increases • Elongation of the eye ball. (ii) Diverging lens	½ ½ ½ ½	

	OR (b) • Very fine particles of the atmosphere scatter short wavelength colour, mainly blue light, but scattering is not prominent at very high altitudes. So, sky appears black.	1+1	2
26	(a) • Vegetative propagation: An asexual method of growing new plants from the vegetative parts of the plants such as root, stem or leaf. • Advantages: (any two) • Plants produced are genetically similar to the parent plant. • Plants produced bear flowers and fruits earlier than those produced from seeds. • Propagation of seedless plants. **OR** (b) (any two)	1 ½ + ½	
	<table><tr><th>Sexual reproduction</th><th>Asexual reproduction</th></tr><tr><td>Two parents (male and female) involved</td><td>Only one parent involved</td></tr><tr><td>Gametes are involved</td><td>Gametes are not involved</td></tr><tr><td>Zygote is formed</td><td>Zygote is not formed</td></tr><tr><td>More variations are seen in the offsprings.</td><td>Less variations are seen in the offsprings.</td></tr></table>	1+1	2
	SECTION C		
27	(a) • pH = 7 • Reason: It is a neutral salt formed by NaOH (strong base) and HCl (strong acid). (b) • Orange • Reason: salt of a weak base and strong acid. (c) • No change/Remains blue	½ ½ ½ ½ ½	

	• Reason: basic salt formed by strong base and a weak acid	½	3
28	(a) (i) Cathode – Hydrogen (ii) Anode – Oxygen (b) As number of molecules of hydrogen gas are twice of number of molecules of oxygen gas, so the volume of H_2 is two times of O_2(gas). (c) (Test for anyone gas) • Test for hydrogen gas: Bring a lighted splinter at the mouth of the test tube containing hydrogen gas, gas burns with pop sound/hiss. • Test for oxygen gas: Insert a glowing splinter into the test tube containing oxygen gas, this splinter reignites.	½ ½ 1 1	3
29	(a) (i) Two characteristics: • Presence of alveoli • Extensive network of blood vessels (or any other) (ii) (1) Nasal passage (2) Diaphragm (3) Alveoli (4) Bronchi (Bronchus) **OR** (b) (i) (1) Kidney (2) Urinary bladder (3) Ureter (4) Urethra Two factors: • Amount of excess water in the body • Amount of dissolved wastes to be excreted	½ + ½ 4 x ½ 4 x ½ ½ ½	3
30	• Plants (green) → Goat → Human Being (or any other food chain) • Pesticides are washed down into the soil and water bodies. From the soil pesticides are absorbed by crop plants and enter the food chain. These chemicals are non-biodegradable and get accumulated progressively at each trophic level.	1 1	

	• As human beings occupy the top level in any food chain, the maximum concentration of these chemicals gets accumulated in our bodies.	1	3
31	(a) (i) Here h = 5 cm; f = + 20 cm; u = - 30 cm Lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} - \frac{1}{-30} = \frac{1}{20}$ $\frac{1}{v} + \frac{1}{30} = \frac{1}{20}$ v = + 60 cm, image distance is 60 cm from the lens. (ii) $h' = \frac{v}{u} \times h$ $= \frac{+60\ cm}{-30\ cm} \times 5$ cm = -10 cm, height of the image is 10 cm. **OR** (b) • Converging or diverging ability of a lens / Reciprocal of focal length of a lens in metre / P = $\frac{1}{f(m)}$ • ➢ Converging ➢ P = $\frac{100}{+25}$ = +4D • Same size • Real • Inverted (any two)	½ ½ 1 ½ ½ 1 ½ ½ ½ + ½	3

32	• Splitting of white light into its component colours when it passes through a prism/rain drop/oil bubble. • Red colour bends the least • Violet colour bends the most. • Different colours of white light bend/refract through different angles with respect to the incident ray as they pass through a prism. **OR** (b) • ➢ After the rain shower. ➢ In a direction opposite to that of the sun. • The tiny water droplets ➢ refract and disperse sunlight then ➢ reflect it internally and finally ➢ refract it again when it comes out of the rain drop. • Two necessary condition – (i) Presence of tiny rain droplets in air. (ii) Sun behind the observer.	1 ½ ½ 1 ½ ½ 1 ½ + ½	3
33	(a) Current used in household supply is AC (alternating current) which changes its direction periodically with time whereas the current given by a battery of dry cells is DC (direct current) which does not change its direction with time. (b) • Alternating current • Alternating current can be transmitted over long distances without much loss of energy. (c) At the time of short circuiting, current in the circuit exceeds the rated value of the fuse, hence the fuse melts and breaks the circuit.	1 ½ ½ 1	3
	SECTION D		
34	(a) (i) (1) Ethanol; C_2H_5OH (2) Ethanoic Acid; CH_3COOH	 ½ + ½ ½ + ½	

	(ii) (1) • An ester is formed • $C_2H_5OH + CH_3COOH \xrightarrow[warm]{Acid} CH_3COOC_2H_5 + H_2O$ Ester (2) • Ethene is formed / $C_2H_5OH \xrightarrow[Excess\ Conc\ H_2SO_4]{443\ K} C_2H_4 + H_2O$ • Conc. H_2SO_4 acts as a dehydrating agent. **OR** (b) (i) • Carbon compounds having same molecular formula but different structures are called structural isomers  / $CH_3—CH_2-CH_2-CH_3$  /  (ii) • Methane, CH_4 • CnH_{2n+2} • C_2H_6 • $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ + heat	½ 1 1 ½ 1 ½ ½ ½+½ ½ ½ 1	5
35	(a)		

	(i) Function of: (1) Stigma: To trap pollen grains. (2) Pollen tube: To transfer male gamete to female gamete. (3) Anther: To produce pollen grains. (ii) (1) Plumule (2) Radicle (iii) (1) Ovule (2) Ovary **OR** (b) (i) • Testes • Testosterone • Function of testosterone: To bring about changes in appearance seen in boys at the time of puberty/Regulate the formation of sperms. (or any other) (ii) (i) Oviduct / Fallopian Tube (ii) Uterus (iii) • The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta which connects growing embryo with the uterine wall. • It acts as a site for exchange of gases and transfer of nutrients from mother's blood to embryo and to remove wastes from embryo to mother's blood.	1 1 1 ½ ½ ½ ½ ½ ½ 1 ½ ½ 2	5
36	(a) • Two factors (any two) (i) Length (l) (ii) area of cross-section (A) (iii) Material of conductor • $R = \rho \frac{l}{A}$ or $\rho = R\, l/A$ • SI unit of ρ = SI unit of (R) × $\frac{\text{SI unit of (A)}}{\text{SI unit of (l)}}$ $= \text{ohm} \times \frac{\text{metre}^2}{\text{metre}} = \text{ohm . metre}$ (b) $\rho = R\, l/A$ $= 40\ \Omega \times \frac{6.5 \times 10^{-8}\ \text{m}^2}{1\ \text{m}}$ $= 26 \times 10^{-7}\ \Omega\text{m}$	½ + ½ 1 1 1 1	5

	SECTION E		
37	(a) A homogeneous mixture of two or more metals or metals and nonmetals. (b) Copper and tin. (c) (i) A homogeneous mixture of Iron, Chromium and Nickel, formed by melting and dissolving these three metals in a proper ratio. • ➢ Stainless steel is harder than iron. ➢ It does not rust. **OR** (c) (ii) • Solder is an alloy of lead and tin. • It is used in welding of electric wires. ➢ Because it has low melting point	1 1 1 ½ ½ 1 ½ ½	4
38	(a) **(Any two)** (i) Round / wrinkled seeds (ii) White / violet flowers (iii) Yellow and green seeds (b) Dominant trait: A trait or gene which expresses itself even in the presence of its contrasting trait Recessive trait: A trait (gene) which cannot express itself in the presence of its dominant trait. (c) (i) • Tall plants: Dwarf plants 3 : 1 • As both the copies of recessive trait reappear in a the F_2 generation **OR** (c) (ii) (any two of the following) **F_1 generation**: Progeny of parental plants/first generation plants is called F_1 generation **F_2 generation**: Progeny of first-generation plants /second generation plants is called F_2 generation Obtained by crossing/cross pollinating parental plants Obtained by selfing /self pollination of F1 generation Only dominant trait/tall plants appear Both dominant and recessive traits may appear/both tall and dwarf pea plants are present.	½ + ½ 1 1 1 1+1	4

39	(a) It is a point on the principal axis of the mirror where rays incident, parallel to principal axis will converge after reflection. (b) R =2f = 2 x 12 cm = 24 cm (c) (i) (1) Image is • real • inverted and • magnified (Any two) (3) Image is • virtual • erect and • magnified (Any two) **OR** **(c)** **(ii)** (1) In this case, the object is at C, therefore R = 40 cm R=2f ∴ Focal length (f) = $\frac{40}{2}\,cm$ = 20 cm (2) Magnification(m) = -1 (Image of same size and inverted)	1 1 ½ + ½ ½ + ½ ½ ½ 1	4