

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2025
SUBJECT : SCIENCE (Q.P. CODE 31/2/1)

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.
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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.
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SECONDARY SCHOOL EXAMINATION, 2025

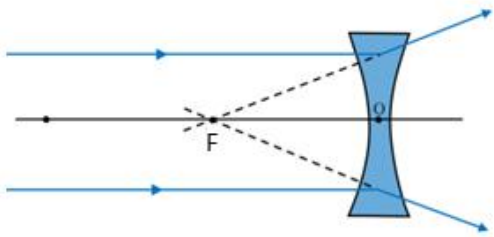
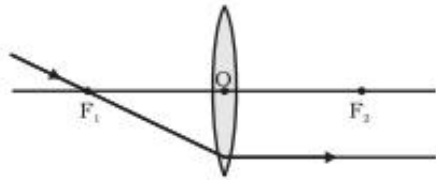
MARKING SCHEME

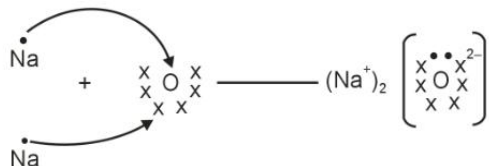
CLASS: X SCIENCE (Subject Code–086)

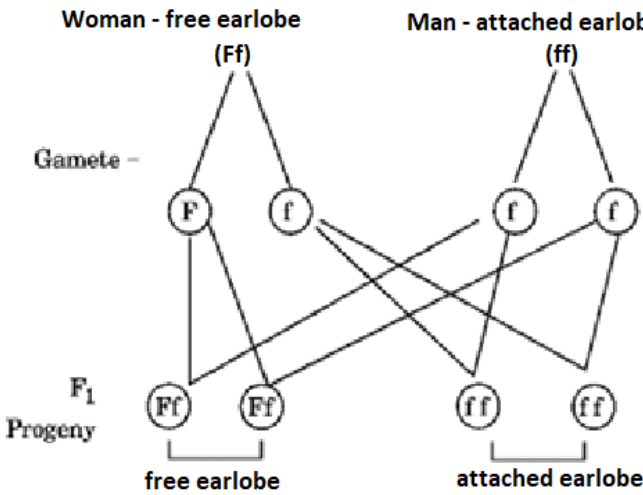
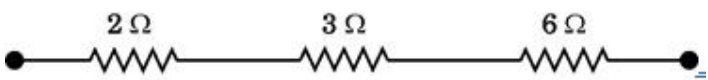
[Paper Code: SET 31/2/1]

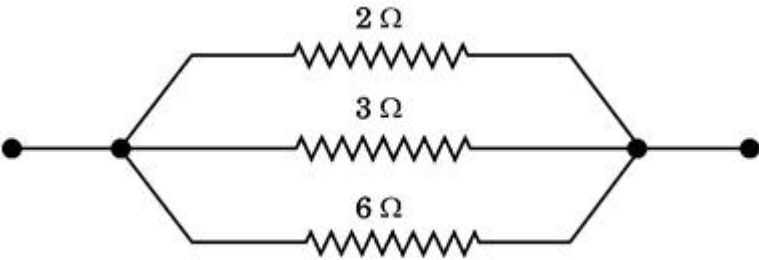
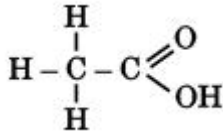
Maximum Marks: 80

Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
SECTION A			
1	(D) / $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{Energy}$	1	1
2	(C) / Sodium	1	1
3	(C) / 7.0 to 7.8	1	1
4	(B) / When it is heated with iron (III) oxide, molten iron is obtained.	1	1
5	(C) / Brass and Bronze	1	1
6	(D) / Amount of water in guard cells	1	1
7	(B) / Capillaries	1	1
8	(C) / Change in amount of water in cells	1	1
9	(B) / Vegetative buds produced in the notches of the leaf	1	1
10	(C) / Ovary and testis both	1	1
11	(A) / $\frac{10}{9}$	1	1
12	(B) / –20 cm	1	1
13	(D) / 1 and 6	1	1
14	(B) / 110 W	1	1
15	(C) / 9 Ω	1	1
16	(C) / DDT, Polyester, Glass	1	1
17	(B) / Both A and R are true, but R is not the correct explanation of A.	1	1
18	(A) / Both A and R are true and R is the correct explanation of A.	1	1
19	(C) / A is true, but R is false.	1	1
20	(A) / Both A and R are true and R is the correct explanation of A.	1	1
SECTION B			
21	(a) Displacement reaction $2\text{AgNO}_3 + \text{Cu} \longrightarrow 2\text{Ag} + \text{Cu}(\text{NO}_3)_2$ (b) Electrolytic refining	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
22	(a) (1) and (4) (b) (i) melting point increases with increasing molecular mass. (ii) Solubility shows regular gradation/ decreases with increase in molecular mass.	1 $\frac{1}{2}$ $\frac{1}{2}$	2
23	- Pons, Medulla, Cerebellum - Medulla	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
24	(a) (i) Protects the seed (ii) Food storage area of the seed/ reserve food material	$\frac{1}{2}$ $\frac{1}{2}$	

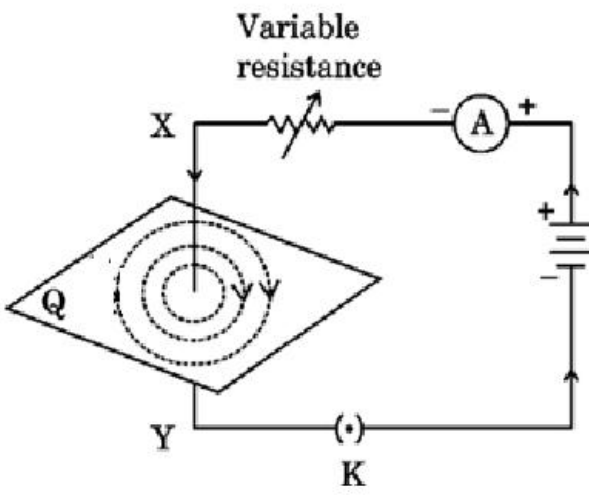
	(iii) Develops into root on germination of seed/future root (iv) Develops into shoot on germination of seed/future shoot OR (b) In a test tube take 10g sugar, add 100 ml of water and a pinch of yeast granules. Keep it in warm place for 1-2 hours.	$\frac{1}{2}$ $\frac{1}{2}$ 2	2
25	(a) Concave lens  OR (b) (i)  (ii) Principal focus /Focus	1 1 1 1	2
26	P = 750 W, V = 220 V - Current drawn by kettle, $I = \frac{P}{V}$ $= 750 \text{ W}/220 \text{ V}$ $= 3.4 \text{ A}$ - No, this kettle cannot be used. - The current drawn by the kettle is more than the fuse rating (3A). So, the fuse will melt and break the circuit.	 $\frac{1}{2}$ $\frac{1}{2}$ 1	2
SECTION C			
27	(a) (i) A single reactant (substance) breaks down to give two or more products. $\text{CaCO}_3 (\text{s}) \xrightarrow{\text{Heat}} \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ $2\text{AgCl} (\text{s}) \xrightarrow{\text{Sunlight}} 2\text{Ag}(\text{s}) + \text{Cl}_2(\text{g})$ $2\text{H}_2\text{O} (\text{l}) \xrightarrow[\text{Current}]{\text{Electric}} 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$ (any other suitable example)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	

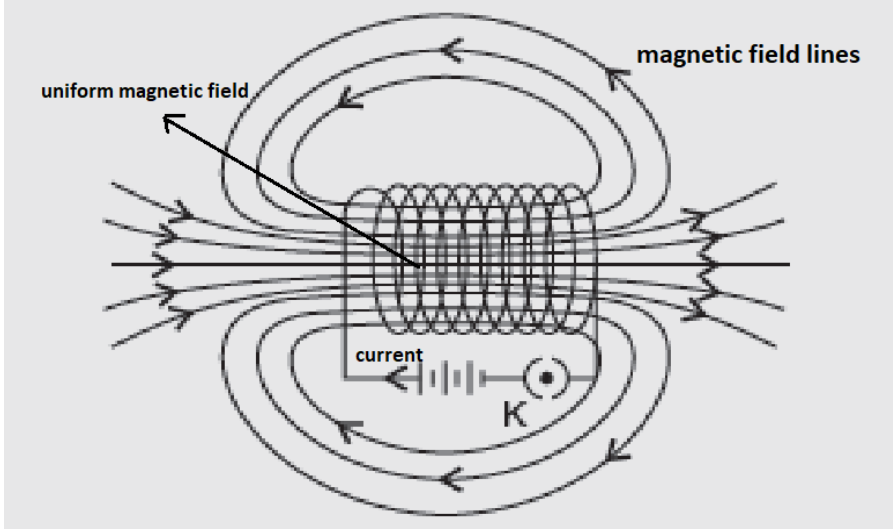
	(ii) because energy (heat) is released. OR (b) - In combination reaction single product (substance) is formed from two or more reactants (substances) whereas in decomposition reaction a single reactant (substance) breaks down to give two or more products (substances). So, the two are opposite. - Example of combination reaction $\text{C(s)} + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g}) + \text{Heat}$ Carbon Oxygen Carbon dioxide - Example of decomposition reaction $\text{CaCO}_3(\text{s}) \xrightarrow{\text{Heat}} \text{CaO(s)} + \text{CO}_2(\text{g})$ Calcium carbonate Calcium Oxide Carbon dioxide (any other suitable example) (Do not deduct marks if physical state not given)	1	
		1	
		1	
		1	
			3
28	Na O 2, 8, 1 2, 6 (i) • Na (ii) •• O : •• Formation of sodium oxide Na₂O  Anion: O²⁻ Cation: Na⁺	½	
		½	
		1	
		½	
		½	3
29	(a) Hormones are chemical messengers (substances) which regulate body functions / Hormones are the biochemical substances produced in one part of the body and move to the target organ or tissue to regulate body function. (b) Example: If the sugar level in blood rises, it is detected by cells of pancreas which respond to produce more insulin to lower blood sugar level. As the blood sugar level falls, it is detected by the cells of pancreas and insulin secretion is reduced. (or any other example)	1	
		2	
			3
30	(a) Dominant trait – free earlobe: F f Recessive trait – Attached earlobe: ff.		

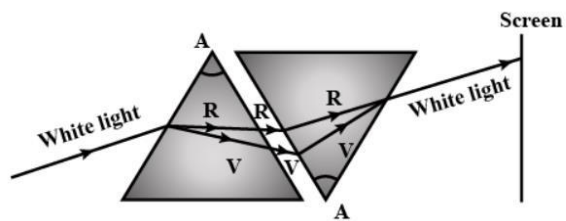
	Parents Woman - free earlobe (Ff) Man - attached earlobe (ff)  50% 50% Progeny- Ff : ff (Award marks if answer is written in explanation form) (b) Gene combinations of: Father – ‘ff’ Mother – ‘Ff’ (award marks if any other letter denoting the trait is used)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
31	(i) Nature: Virtual and erect (ii) Given $h' = + 8.0$ cm, $h = + 2.0$ cm, $u = - 6$ cm $m = \frac{h'}{h} = \frac{v}{u}$ $= \frac{8.0\text{cm}}{2.0\text{cm}} = \frac{v}{-6\text{ cm}}$ or $v = - 24$ cm Thus, the image is at a distance of 24 cm from the lens. (iii) Lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{-24} - \frac{1}{-6} = \frac{1}{f}$ $\frac{-1}{24} + \frac{1}{6} = \frac{1}{f}$ $\frac{1}{8} = \frac{1}{f}$ $f = 8$ cm Thus the focal length of the lens = 8 cm	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
32	(i)  In series, $R_s = R_1 + R_2 + R_3$ $= (2 + 3 + 6) \Omega = 11 \Omega$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3

	(ii)  In parallel, $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ $= \frac{1}{2} + \frac{1}{3} + \frac{1}{6}$ $= \frac{3+2+1}{6}$ $R_p = 1.0 \Omega$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
33	- Ozone (O₃) shields the surface of earth from Ultra violet (UV) radiation which are highly damaging to organisms (may cause skin cancer). - Ultra violet (UV) radiations split apart some molecular oxygen (O₂) into free oxygen (O) atoms. These atoms then combine with molecular oxygen to form ozone. / $\text{O}_2 \xrightarrow{\text{UV}} \text{O} + \text{O}$ $\text{O} + \text{O}_2 \rightarrow \text{O}_3 \text{ (Ozone)}$ - Chlorofluorocarbons (CFCs)/ freons	1 1 1	3
SECTION D			
34	(a) (i) X- Ethanoic acid/ Acetic acid  / CH₃COOH (ii) pH of 'X' will be higher than that of a mineral acid. (iii) Esterification reaction $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{OH} \xrightleftharpoons{\text{Acid}} \text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O}$ (X) (or reaction with any other alcohol) (iv) $2\text{CH}_3\text{COOH} + \text{Na}_2\text{CO}_3 \longrightarrow 2\text{CH}_3\text{COONa} + \text{CO}_2 + \text{H}_2\text{O}$ (X) Sodium acetate/sodium ethanoate (balancing of equation is not mandatory)	$\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$	

	OR (b) (i) <table><thead><tr><th>Saturated hydrocarbons</th><th>Unsaturated hydrocarbons</th></tr></thead><tbody><tr><td>Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula C_nH_{2n+2}</td><td>Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and C_nH_{2n-2}</td></tr><tr><td>Example: Propane H H H H C C C H H H H / $CH_3CH_2CH_3$ (any other) </td><td>Example: Propene- $CH_2=CH-CH_3$/ H H C = C - C - H H H H / Propyne $H-C\equiv C-C-H$ H H C \equiv C - C - H H (any other) </td></tr></tbody></table>	Saturated hydrocarbons	Unsaturated hydrocarbons	Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula C_nH_{2n+2}	Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and C_nH_{2n-2}	Example: Propane H H H H C C C H H H H / $CH_3CH_2CH_3$ (any other)	Example: Propene- $CH_2=CH-CH_3$ / H H C = C - C - H H H H / Propyne $H-C\equiv C-C-H$ H H C \equiv C - C - H H (any other)	1	
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	(ii) • Addition of hydrogen in the presence of Ni orPd / Hydrogenation / H H C = C H H H_2 $\xrightarrow{Ni/Pd}$ H H H C - C - H H H (any other) • It is used in the hydrogenation of vegetable oil.	1							
	(iii) Butene H H H H H C - C - C = C H H H / H H H H H C - C = C - C - H H H	1/2							
		1/2	5						
35	(a) (i) Animals (Herbivores) eating grass need a longer small intestine to digest cellulose. Meat is easier to digest, hence meat eating animals (Carnivores) have shorter small intestine.	2							

	(ii) Role of Pancreas – Secrete pancreatic juice which contains trypsin for digesting proteins, lipase for breaking down emulsified fats. Role of Bile- Bile emulsifies fats and makes the medium alkaline in the small intestine so that pancreatic enzymes can act. (iii) The inner lining of the small intestine has numerous finger-like projections called villi which increase the surface area for absorption of food. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body. OR (b) (i) ‘Rings of cartilage’ ensures that the air passage does not collapse in absence of air. (ii) Ribs are lifted → Diaphragm flattens → Chest cavity become larger → Air is sucked into the lungs (Alveoli) and we breathe in (iii) Due to lack of oxygen in our muscle cells (anaerobic respiration), pyruvate is converted into lactic acid, build-up of lactic acid in our muscles causes cramps.	1		
		1		
		1		
		1		
		1		
		1		
		2		
		2		
		2		
		5		
36	(a) (i)  (ii) Right hand thumb rule Statement of the rule - Imagine holding a current carrying straight conductor in the right hand such that the thumb points towards the direction of current, then the fingers will wrap around the conductor in the direction of the field lines of the magnetic field. (iii) - According to Fleming’s left-hand rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor. - Out of the plane/ upwards	1½		
		½		
		1		
		1		
		1		

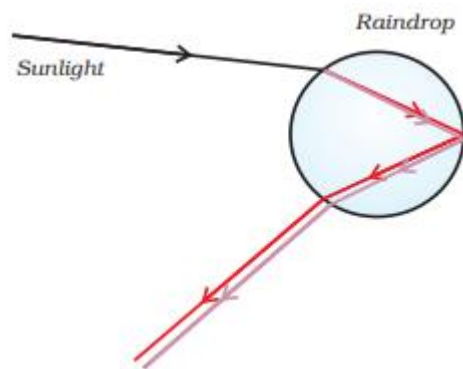
	OR (b) (i) Solenoid is a coil of many turns of insulated copper wire wrapped closely in the shape of a cylinder.  Diagram Marking (i), (ii) and (iii) (ii) By inserting a piece of magnetic material like soft iron inside the current carrying solenoid.	1 1½ ½ × 3 1	
SECTION E			
37	(a) P – pH 0 to 4 Q – pH 12 to 14 (b) (i) By adding sodium hydroxide (or any other base) (ii) By adding hydrochloric acid (or any other mineral or strong acid) (c) (i) • Hydronium ion ($\text{H}_3\text{O}^+/\text{H}^+$) ion concentration increases. • Colour will change from yellow/orange to red/pink OR (c) (ii) • low pH/ between 1 to 3 • by the use of antacids/milk of magnesia/sodium hydrogen carbonate • Magnesium hydroxide/$\text{Mg}(\text{OH})_2$	½ ½ ½ ½ 1 1 1 ½ ½	4
38	(a) Oviduct/ fallopian tube (b) The lining of uterus thickens (it becomes spongy) and is richly supplied with blood to nourish the growing embryo. (c) (i) The uterine lining slowly breaks down and comes out as blood and mucous along with unfertilized egg. Hence, menstruation will occur. OR (c) (ii) With the help of special tissue called Placenta which is embedded in uterine wall. It provides oxygen, nutrients from mother to embryo.	1 1 2 2	4
39	(a) Dispersion of light (b) Different colours of light bend through different angles with respect to the incident ray as they pass through a prism. (c) (i) Two identical prisms are placed in inverted position with respect to each other as shown. When spectrum produced by prism A is passed through the prism B, a beam of white light emerges from the other side of the prism B.	1 1	



(award full marks even if only labelled ray diagram is given)

OR

(c)(ii)



(deduct ½ marks if arrows are not marked)

2

2

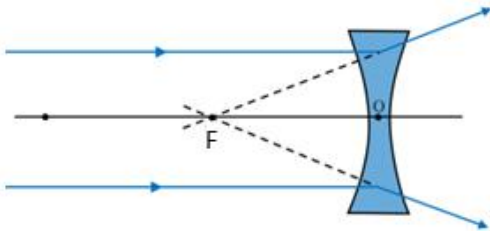
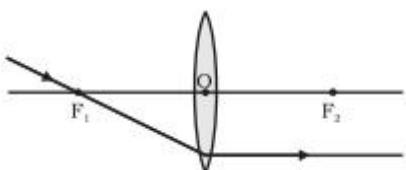
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	(ii) Food storage area of the seed/ reserve food material (iii) Develops into root on germination of seed/future root (iv) Develops into shoot on germination of seed/future shoot OR (b) In a test tube take 10g sugar, add 100 ml of water and a pinch of yeast granules. Keep it in warm place for 1-2 hours.	½ ½ ½ 2	2
25.	(a) Concave lens  OR (b) (i)  (ii) Principal focus /Focus	1 1 1 1	2
26.	P = 5 kW, V = 200V Current drawn by electrical appliance = $I = \frac{P}{V}$ $= \frac{5000}{200} = 25A$ No, The given electric fuse cannot be used The fuse will melt and appliance stops working.	½ ½ 1	2
SECTION C			
27.	(a) (i) A single reactant (substance) breaks down to give two or more products. $\text{CaCO}_3 (\text{s}) \xrightarrow{\text{Heat}} \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ $2\text{AgCl} (\text{s}) \xrightarrow{\text{Sunlight}} 2\text{Ag}(\text{s}) + \text{Cl}_2(\text{g})$ $2\text{H}_2\text{O} (\text{l}) \xrightarrow[\text{Current}]{\text{Electric}} 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$	½ ½ ½	

	(any other suitable example) (ii) because energy (heat) is released. OR (b) - In combination reaction single product (substance) is formed from two or more reactants (substances) whereas in decomposition reaction a single reactant (substance) breaks down to give two or more products (substances). So, the two are opposite. - Example of combination reaction $\text{C(s)} + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g}) + \text{Heat}$ Carbon Oxygen Carbon dioxide - Example of decomposition reaction $\text{CaCO}_3(\text{s}) \xrightarrow{\text{Heat}} \text{CaO(s)} + \text{CO}_2$ Calcium carbonate Calcium Oxide Carbon dioxide (any other suitable example) (do not deduct marks if physical state not given)	1	
28.	(a) Aluminium (Al) and Iron (Fe) (b) $2\text{Al} + 3\text{H}_2\text{O(g)} \longrightarrow \text{Al}_2\text{O}_3 + 3\text{H}_2$ $3\text{Fe} + 4\text{H}_2\text{O(g)} \longrightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$	$\frac{1}{2} + \frac{1}{2}$	
29.	(a) The process of detecting the signal or the input and responding to it by an output action, completed quickly. Such a connection is called as reflex arc / A pathway followed during reflex action is called reflex arc./ (award mark if reflex arc is shown with a labelled diagram or a flowchart) Reflex arc is formed in the spinal cord. (b) Reflex arcs have evolved in animals because the thinking process of the brain is not fast enough. / Brain may take longer time to respond.	1	3

30.	(a) Dominant trait – free earlobe: F f Recessive trait – Attached earlobe: ff. Parents Woman - free earlobe Man - attached earlobe (Ff) (ff) Gamete – F₁ Progeny free earlobe attached earlobe 50% 50% Progeny Ff : ff (Award marks if answer is written in explanation form) (b) Gene combinations of: Father – ‘ff’ Mother – ‘Ff’ (award marks if any other letter denoting the trait is used)	1/2 1/2 1/2 1/2 1/2 1/2	3
31.	(i) $u = -20 \text{ cm}, v = -10 \text{ cm}$ $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{-10} - \frac{1}{-20} = \frac{1}{f}$ $\frac{-1}{10} + \frac{1}{20} = \frac{1}{f}$ $\frac{-2+1}{20} = \frac{1}{f}$ $\frac{-1}{20} = \frac{1}{f}$ $f = -20 \text{ cm}$ (ii) $P = \frac{1}{f(m)}$ $= \frac{1}{-0.2} = -5D$	1/2 1/2 1 1/2 1/2	3
32.	$R = 35 \Omega$ Diameter (2r) = 0.2 mm = $2 \times 10^{-4} \text{ m}$ $\therefore r = 10^{-4} \text{ m}$		

	Length of the wire = 1 m $R = \rho \frac{l}{A}$ Area of cross section, $A = \pi r^2$ Resistivity, $\rho = \frac{RA}{l} = \frac{35 \times \frac{22}{7} \times (10^{-4})^2}{1}$ $= 110 \times 10^{-8} \Omega\text{m}$ Resistivity of the wire will not change as it is a characteristic property of the material which does not depend on the dimensions of the wire.	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$	3
33.	- Ozone (O_3) shields the surface of earth from Ultra violet (UV) radiation which are highly damaging to organisms (may cause skin cancer). - Ultra violet (UV) radiations split apart some molecular oxygen (O_2) into free oxygen (O) atoms. These atoms then combine with molecular oxygen to form ozone. / $\text{O}_2 \xrightarrow{\text{UV}} \text{O} + \text{O}$ $\text{O} + \text{O}_2 \rightarrow \text{O}_3 \text{ (Ozone)}$ - Chlorofluorocarbons (CFC)/ freons	1 1 1	3
SECTION D			
34.	(a) (i) X - Ethanoic acid/ Acetic acid $\begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} - \text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\ \\ \text{H} \end{array} \quad / \text{CH}_3\text{COOH}$ (ii) pH of 'X' will be higher than that of a mineral acid. (iii) Esterification reaction $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{OH} \xrightleftharpoons{\text{Acid}} \text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O}$ (X) (or reaction with any other alcohol) (iv) $2\text{CH}_3\text{COOH} + \text{Na}_2\text{CO}_3 \longrightarrow 2\text{CH}_3\text{COONa} + \text{CO}_2 + \text{H}_2\text{O}$ (X) Sodium acetate/sodium ethanoate (balancing of equation is not mandatory)	$\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$	

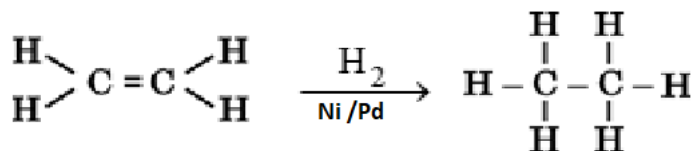
OR

(b) (i)

Saturated hydrocarbons	Unsaturated hydrocarbons
Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula C_nH_{2n+2}	Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and C_nH_{2n-2}
Example – Propane $\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H} - \text{C} - & \text{C} - & \text{C} - \text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$ / $\text{CH}_3\text{CH}_2\text{CH}_3$ (any other)	Example – Propene- $\text{CH}_2=\text{CH}-\text{CH}_3$ / $\begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} = \text{C} - \text{C} - \text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array} \quad /$ Propyne $\text{H} - \text{C} \equiv \text{C} - \text{C} - \text{H}$ $\begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} \equiv \text{C} - \text{C} - \text{H} \\ \\ \text{H} \end{array}$ (any other)

(ii)

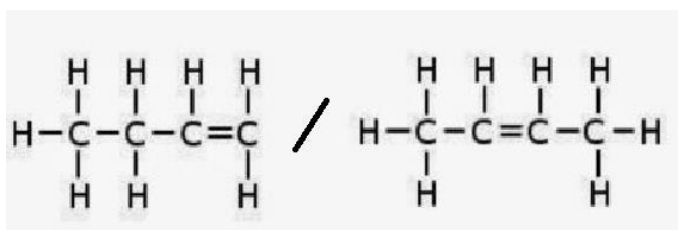
- Addition of hydrogen in the presence of Ni or Pd / Hydrogenation /



(any other)

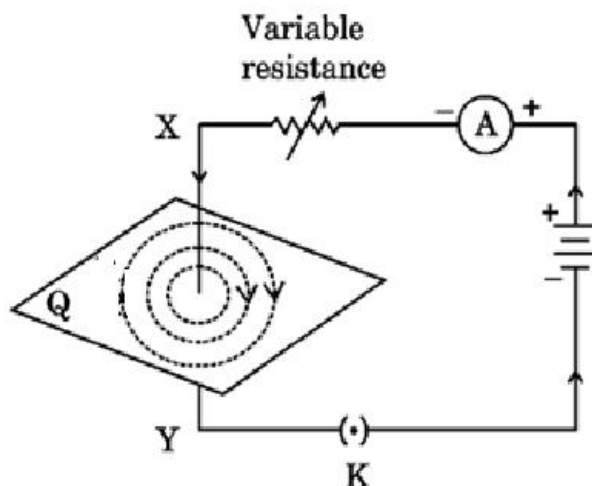
- It is used in the hydrogenation of vegetable oil.

(iii) Butene



35.

(a) (i)



1½

(ii) Right hand thumb rule

½

Statement of the rule - Imagine holding a current carrying straight conductor in the right hand such that the thumb points towards the direction of current, then the fingers will wrap around the conductor in the direction of the field lines of the magnetic field.

1

(iii)

- According to Fleming's left-hand rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.
- Out of the plane/ upwards

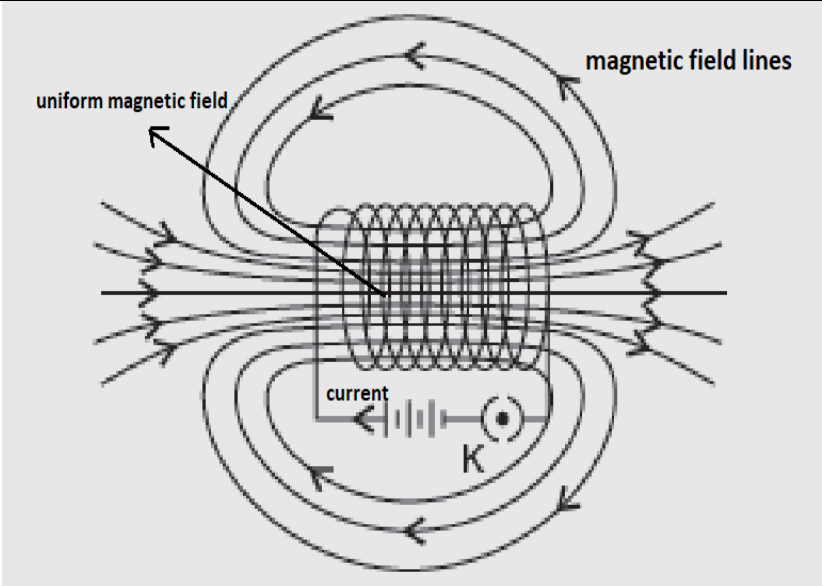
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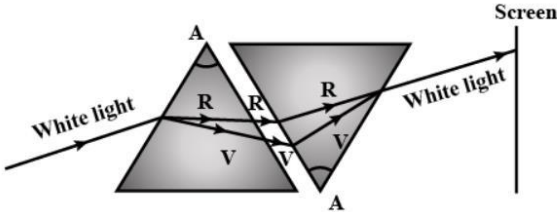
OR

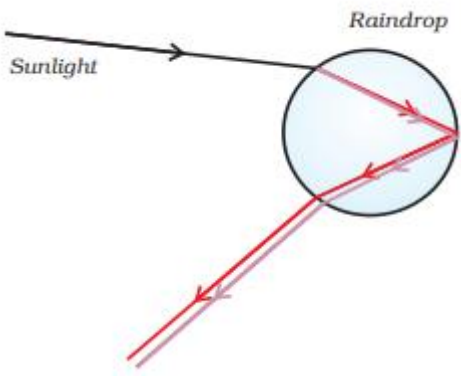
(b) (i) Solenoid is a coil of many turns of insulated copper wire wrapped closely in the shape of a cylinder.

1

	 Diagram Marking (i), (ii) and (iii) (ii) By inserting a piece of magnetic material like soft iron inside the current carrying solenoid.	1½ ½ × 3 1	5
36.	(a) (i) Animals (Herbivores) eating grass need a longer small intestine to digest cellulose. Meat is easier to digest, hence meat eating animals (Carnivores) have shorter small intestine. (ii) Role of Pancreas – Secrete pancreatic juice which contains trypsin for digesting proteins, lipase for breaking down emulsified fats. Role of Bile- Bile emulsifies fats and makes the medium alkaline in the small intestine so that pancreatic enzymes can act. (iii) The inner lining of the small intestine has numerous finger-like projections called villi which increase the surface area for absorption of food. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body. OR (b) (i) ‘Rings of cartilage’ ensures that the air passage does not collapse in absence of air. (ii) Ribs are lifted → Diaphragm flattens → Chest cavity become larger → Air is sucked into the lungs (Alveoli) and we breathe in (iii) Due to lack of oxygen in our muscle cells (anaerobic respiration), pyruvate is converted into lactic acid, build-up of lactic acid in our muscles causes cramps.	2 1 1 1 1 2 2	5

SECTION E

37.	(a) P – pH 0 to 4 Q – pH 12 to 14 (b) (i) By adding sodium hydroxide (or any other base) (ii) By adding hydrochloric acid (or any other mineral or strong acid) (c) (i) • Hydronium ion ($\text{H}_3\text{O}^+/\text{H}^+$) ion concentration increases. • Colour will change from yellow/orange to red/pink OR (c)(ii) • low pH/ between 1 to 3 • by the use of antacids/milk of magnesia/sodium hydrogen carbonate • Magnesium hydroxide/$\text{Mg}(\text{OH})_2$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$	4
38.	(a) Oviduct/ fallopian tube (b) The lining of uterus thickens (it becomes spongy) and is richly supplied with blood to nourish the growing embryo. (c) (i) The uterine lining slowly breaks down and comes out as blood and mucous along with unfertilized egg. Hence, menstruation will occur. OR (c) (ii) With the help of special tissue called Placenta which is embedded in uterine wall. It provides oxygen, nutrients from mother to embryo.	1 1 2 2	4
39.	(a) Dispersion of light (b) Different colours of light bend through different angles with respect to the incident ray as they pass through a prism. (c) (i) Two identical prisms are placed in inverted position with respect to each other as shown. When spectrum produced by prism A is passed through the prism B, a beam of white light emerges from the other side of the prism B.  (award full marks even if only labelled ray diagram is given) OR (c)(ii)	1 1 2	

	 (deduct ½ mark if arrows are not marked)	2	
			4

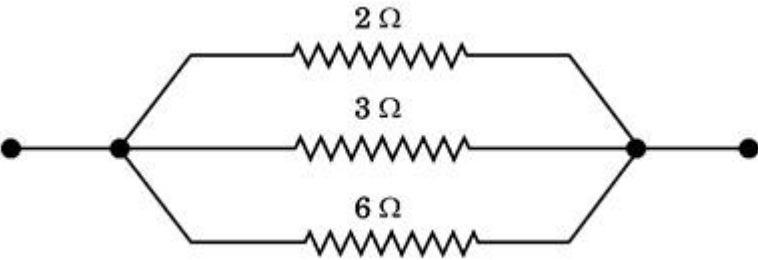
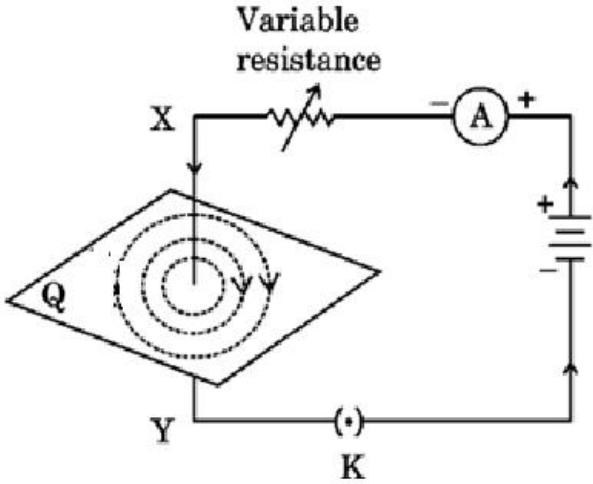
Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Secondary School Examination, 2025
SUBJECT NAME : SCIENCE (Q.P. CODE 31/2/3)

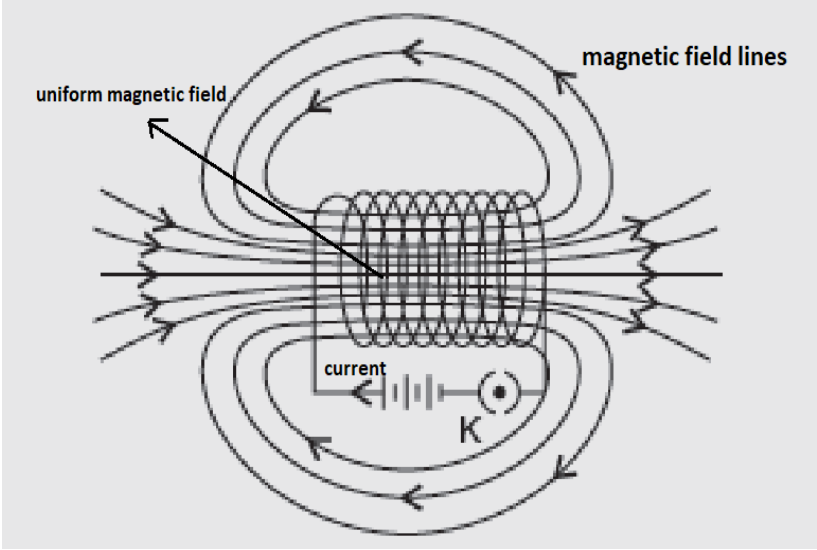
General Instructions: -

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 Newspaper/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 deliberation 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). This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- • Leaving answer or part thereof unassessed in an answer book. • 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. • 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 unassessed 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 totalled 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.

	• $\text{CaCO}_3 (\text{s}) \xrightarrow{\text{Heat}} \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ • $2\text{AgCl} (\text{s}) \xrightarrow{\text{Sunlight}} 2\text{Ag}(\text{s}) + \text{Cl}_2(\text{g})$ • $2\text{H}_2\text{O} (\text{l}) \xrightarrow[\text{Current}]{\text{Electric}} 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$ (any other suitable example) (ii) because energy (heat) is released. OR (b) • In combination reaction single product (substance) is formed from two or more reactants (substances) whereas in decomposition reaction a single reactant (substance) breaks down to give two or more products (substances). So, the two are opposite. • Example of combination reaction $\begin{array}{ccccccc} \text{C}(\text{s}) & + & \text{O}_2 (\text{g}) & \longrightarrow & \text{CO}_2(\text{g}) & + & \text{Heat} \\ \text{Carbon} & & \text{Oxygen} & & \text{Carbon dioxide} & & \end{array}$ • Example of decomposition reaction $\begin{array}{ccccccc} \text{CaCO}_3 (\text{s}) & \xrightarrow{\text{Heat}} & \text{CaO}(\text{s}) & + & \text{CO}_2 & & \\ \text{Calcium carbonate} & & \text{Calcium Oxide} & & \text{Carbon dioxide} & & \end{array}$ (any other suitable example) (do not deduct marks if physical state not given)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 1	3
28.	(a) X – Basic Y – Acidic ↓ ↓ pH range 9 – 11 pH range 4 – 6 (b) ‘A’ – metal, because it forms basic oxide.	$\frac{1}{2} \times 4$ $\frac{1}{2} + \frac{1}{2}$	3
29.	(a) Hormones are chemical messengers (substances) which regulate body functions / Hormones are the biochemical substances produced in one part of the body and move to the target organ or tissue to regulate body function. (b) Example: If the sugar level in blood rises, it is detected by cells of pancreas which respond to produce more insulin to lower blood sugar level. As the blood sugar level falls, it is detected by the cells of pancreas and insulin secretion is reduced. (or any other example)	1 2	3

	(ii)  In parallel, $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ $= \frac{1}{2} + \frac{1}{3} + \frac{1}{6}$ $= \frac{3+2+1}{6}$ $R_p = 1.0 \Omega$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
33.	• Biological magnification • Reason: These chemicals are not biodegradable and they get accumulated over successive trophic levels. Since, human beings occupy the top level in a food chain, they are affected the most.	1 2	3
SECTION D			
34.	(a) (i)  (ii) Right hand thumb rule Statement of the rule - Imagine holding a current carrying straight conductor in the right hand such that the thumb points towards the direction of current, then the fingers will wrap around the conductor in the direction of the field lines of the magnetic field.	$1\frac{1}{2}$ $\frac{1}{2}$ 1	

	(iii) - According to Fleming's left-hand rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor. - Out of the plane/ upwards OR (b) (i) Solenoid is a coil of many turns of insulated copper wire wrapped closely in the shape of a cylinder.  Diagram Marking (i), (ii) and (iii) (ii) By inserting a piece of magnetic material like soft iron inside the current carrying solenoid.	1 1 1 1½ ½ × 3 1	
35.	(a) (i) X - Ethanoic acid/ Acetic acid $ \begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} - \text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\ \\ \text{H} \end{array} $ / CH₃COOH (ii) pH of 'X' will be higher than that of a mineral acid. (iii) Esterification reaction $ \text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{OH} \xrightleftharpoons{\text{Acid}} \text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O} $ (X) (or reaction with any other alcohol)	½ 1 ½ ½ 1	

(iv) $2\text{CH}_3\text{COOH} + \text{Na}_2\text{CO}_3 \longrightarrow 2\text{CH}_3\text{COONa} + \text{CO}_2 + \text{H}_2\text{O}$ (X) Sodium acetate/sodium ethanoate (balancing of equation is not mandatory) OR (b) (i) <table><tr><th>Saturated hydrocarbons</th><th>Unsaturated hydrocarbons</th></tr><tr><td>Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula $\text{C}_n\text{H}_{2n+2}$</td><td>Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and $\text{C}_n\text{H}_{2n-2}$</td></tr><tr><td>Example – Propane $\begin{array}{ccccccc} & \text{H} & & \text{H} & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\text{CH}_3\text{CH}_2\text{CH}_3$ (any other)</td><td>Example – Propene- $\text{CH}_2=\text{CH}-\text{CH}_3$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & = & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & \equiv & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & & & & & \text{H} & \end{array}$ Propyne (any other)</td></tr></table> (ii) • Addition of hydrogen in presence of Ni or Pd / Hydrogenation / $\begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C} = \text{C} & \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array} \xrightarrow[\text{Ni/Pd}]{\text{H}_2} \begin{array}{c} \text{H} & \text{H} \\ & \\ \text{H} - \text{C} - & \text{C} - \text{H} \\ & \\ \text{H} & \text{H} \end{array}$ (or any other) • It is used in the hydrogenation of vegetable oil. (iii) Butene	Saturated hydrocarbons	Unsaturated hydrocarbons	Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula $\text{C}_n\text{H}_{2n+2}$	Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and $\text{C}_n\text{H}_{2n-2}$	Example – Propane $\begin{array}{ccccccc} & \text{H} & & \text{H} & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\text{CH}_3\text{CH}_2\text{CH}_3$ (any other)	Example – Propene- $\text{CH}_2=\text{CH}-\text{CH}_3$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & = & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & \equiv & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & & & & & \text{H} & \end{array}$ Propyne (any other)	1 ½ 1 1 1 1 ½	
Saturated hydrocarbons	Unsaturated hydrocarbons							
Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula $\text{C}_n\text{H}_{2n+2}$	Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and $\text{C}_n\text{H}_{2n-2}$							
Example – Propane $\begin{array}{ccccccc} & \text{H} & & \text{H} & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\text{CH}_3\text{CH}_2\text{CH}_3$ (any other)	Example – Propene- $\text{CH}_2=\text{CH}-\text{CH}_3$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & = & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{H} & & \text{H} & \end{array}$ / $\begin{array}{ccccccc} & & & & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & \equiv & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & & & & & \text{H} & \end{array}$ Propyne (any other)							

	$ \begin{array}{cccc} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & = \text{C} \\ & & & & \\ & \text{H} & \text{H} & & \text{H} \end{array} \quad / \quad \begin{array}{cccc} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & \\ \text{H} & - \text{C} & - \text{C} & = \text{C} & - \text{C} & - \text{H} \\ & & & & \\ & \text{H} & & & \text{H} \end{array} $	1/2	5
36	(a) (i) Animals (Herbivores) eating grass need a longer small intestine to digest cellulose. Meat is easier to digest, hence meat eating animals (Carnivores) have shorter small intestine. (ii) Role of Pancreas – Secrete pancreatic juice which contains trypsin for digesting proteins, lipase for breaking down emulsified fats. Role of Bile- Bile emulsifies fats and makes the medium alkaline in the small intestine so that pancreatic enzymes can act. (iii) The inner lining of the small intestine has numerous finger-like projections called villi which increase the surface area for absorption of food. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body. OR (b) (i) ‘Rings of cartilage’ ensures that the air passage does not collapse in absence of air. (ii) Ribs are lifted → Diaphragm flattens → Chest cavity become larger → Air is sucked into the lungs (Alveoli) and we breathe in (iii) Due to lack of oxygen in our muscle cells (anaerobic respiration), pyruvate is converted into lactic acid, build-up of lactic acid in our muscles causes cramps.	2 1 1 1 1 2 2	5
SECTION E			
37.	(a) Oviduct/ fallopian tube (b) The lining of uterus thickens (it becomes spongy) and is richly supplied with blood to nourish the growing embryo. (c) (i) The uterine lining slowly breaks down and comes out as blood and mucous along with unfertilized egg. Hence, menstruation will occur. . OR (c) (ii) With the help of special tissue called Placenta which is embedded in uterine wall. It provides oxygen, nutrients from mother to embryo.	1 1 2 2	4
38.	(a) Dispersion of light (b) Different colours of light bend through different angles with respect to the incident ray as they pass through a prism. (c) (i) Two identical prisms are placed in inverted position with respect to each other as shown. When spectrum produced by prism A is passed through the prism B, a beam of white light emerges from the other side of the prism B.	1 1 2	

	(award full marks even if only labelled ray diagram is given) OR (c) (ii) (deduct ½ marks if arrows are not marked)	2 4	
39.	(a) P – pH 0 to 4 Q – pH 12 to 14 (b) (i) By adding sodium hydroxide (or any other base) (ii) By adding hydrochloric acid (or any other mineral or strong acid) (c) (i) • Hydronium ion ($\text{H}_3\text{O}^+/\text{H}^+$) ion concentration increases. • Colour will change from yellow/orange to red/pink OR (c) (ii) • low pH/ between 1 to 3 • by the use of antacids/milk of magnesia/sodium hydrogen carbonate • Magnesium hydroxide/$\text{Mg}(\text{OH})_2$	½ ½ ½ ½ 1 1 1 ½ ½	4