SECONDARY SCHOOL EXAMINATION, 2025

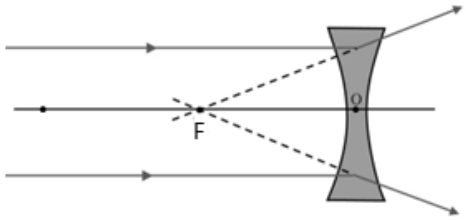
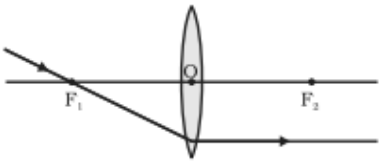
MARKING SCHEME

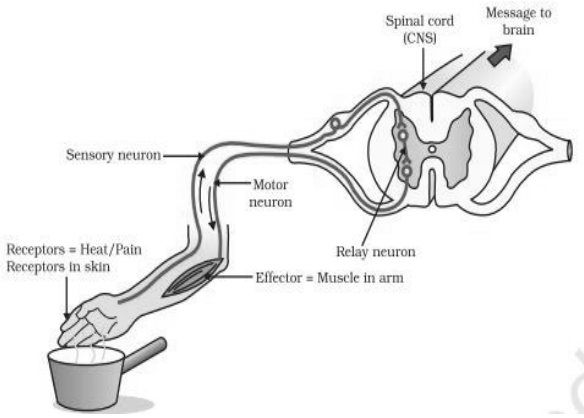
CLASS: X []SCIENCE (Subject Code–086)

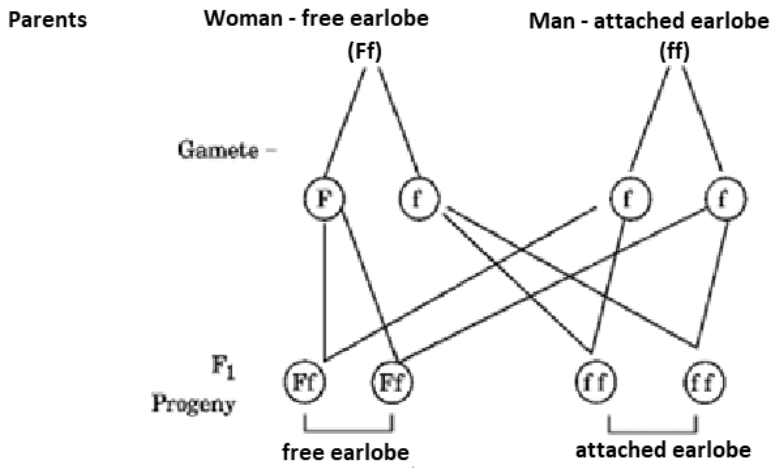
[Paper Code: SET 31/2/2]

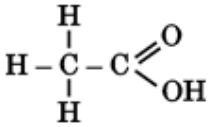
Maximum Marks: 80

Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1.	(C) / Sodium	1	1
2.	(B) / When it is heated with iron (III) oxide, molten iron is obtained.	1	1
3.	(C)/ Na_2ZnO_2	1	1
4.	(C) / Brass and Bronze	1	1
5.	(D) / $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$ + Energy	1	1
6.	(A) / Nitrogen	1	1
7.	(C)/ Ovary and testis both	1	1
8.	(B) /Capillaries	1	1
9.	(C) /As compared to the parent plant, vegetatively propagated plants show more variations.	1	1
10.	(C) / Change in amount of water in cells	1	1
11.	(C) / 9 Ω	1	1
12.	(A) / $\frac{10}{9}$	1	1
13.	(A) / Cornea	1	1
14.	(B) / Higher than that of its constituent metals.	1	1
15.	(B) / –20 cm	1	1
16.	(C) / DDT, Polyester, Glass	1	1
17.	(A) / Both A and R are true and R is the correct explanation of A	1	1
18.	(C) /A is true, but R is false.	1	1
19.	(A) / Both A and R are true and R is the correct explanation of A.	1	1
20.	(A) /Both A and R are true and R is the correct explanation of A.	1	1
	SECTION B		
21.	(a) $6\,CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6O_2 + 6H_2O$ (b) $2Pb(NO_3)_2 \xrightarrow{\text{Heat}} 2PbO + 4NO_2 + O_2$	1 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 ½ ½	2
23.	(a) Root – Movement: positive geotropism; Stimulus: gravity / Root – Movement: negative phototropism; Stimulus: light (b) Shoot – Movement: Negative geotropism; Stimulus: gravity / Shoot – Movement: positive phototropism; Stimulus: light	½+ ½ ½+ ½	2
24.	(a) (i) Protects the seed	½	

	(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 take10g 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. • $CaCO_3(s) \xrightarrow{Heat} CaO(s) + CO_2(g)$ • $2AgCl(s) \xrightarrow{Sunlight} 2Ag(s) + Cl_2(g)$ • $2H_2O(l) \xrightarrow[Current]{Electric} 2H_2(g) + O_2(g)$	½ ½ ½ ½	

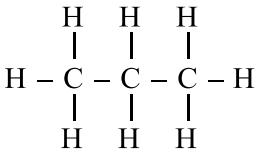
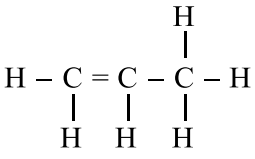
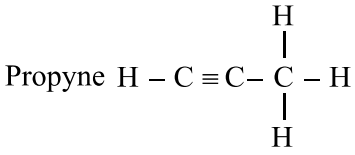
	(any other suitable example) (ii) because energy (heat) is released. **OR** (b) • In combination reaction single product (substance) is formed from two or more reactants (substances) whereas in decomposition reaction a single reactant (substance) breaks down to give two or more products (substances). So, the two are opposite. • Example of combination reaction $C(s) + O_2(g) \longrightarrow CO_2(g) + Heat$ Carbon Oxygen Carbon dioxide • Example of decomposition reaction $CaCO_3(s) \xrightarrow{Heat} CaO(s) + CO_2$ 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.	(a) Aluminium (Al) and Iron (Fe) (b) • $2Al + 3H_2O(g) \longrightarrow Al_2O_3 + 3H_2$ • $3Fe + 4H_2O(g) \longrightarrow Fe_3O_4 + 4H_2$	½+½ 1 1	3
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 1 1	3

30.	(a) Dominant trait – free earlobe: F f Recessive trait – 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)**	½ ½ ½ ½ ½ ½	3
31.	(i) u = –20 cm, v = –10 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 cm (ii) $P = \frac{1}{f(m)}$ $= \frac{1}{-0.2}$ = -5D	½ ½ 1 ½ ½	3
32.	R = **35** Ω Diameter (2r) = 0·2 mm = 2×10^{-4} m $\quad \therefore r = 10^{-4}$ m		

	Length of the wire = 1 m $R = \rho \frac{l}{A}$ Area of cross section, A = πr^2 Resistivity, $\rho = \frac{RA}{l} = \frac{35 \times \frac{22}{7} \times (10^{-4})^2}{1}$ $= 110 \times 10^{-8}\ \Omega m$ 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.	½ ½ 1 ½ ½	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. / $O_2 \xrightarrow{UV} O + O$ $O + O_2 \rightarrow O_3$ (Ozone) • Chlorofluorocarbons (CFC)/ freons	1 1 1	3
	SECTION D		
34.	(a) (i) X - Ethanoic acid/ Acetic acid  / CH_3COOH (ii) pH of 'X' will be higher than that of a mineral acid. (iii) Esterification reaction $CH_3COOH + CH_3CH_2OH \underset{}{\overset{Acid}{\rightleftharpoons}} CH_3 - COOCH_2CH_3 + H_2O$ (X) (or reaction with any other alcohol) (iv) $2CH_3COOH + Na_2CO_3 \longrightarrow 2CH_3COONa + CO_2 + H_2O$ (X) Sodium acetate/sodium ethanoate (balancing of equation is not mandatory)	½ 1 ½ ½ 1 1 ½	

OR

(b) (i)

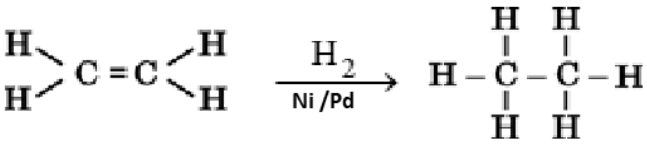
Saturated hydrocarbons	Unsaturated hydrocarbons
Compounds which have single covalent bond between all carbon atoms. / Compounds with general formula C_nH_{2n+2}	Compounds which have at least one double or triple bond between carbon and carbon atom. / Compounds with general formula C_nH_{2n} and C_nH_{2n-2}
Example – Propane  / $CH_3CH_2CH_3$ (any other)	Example – Propene- $CH_2=CH-CH_3$/  / Propyne  (any other)

1

1

(ii)

- Addition of hydrogen in the presence of Ni orPd / Hydrogenation /

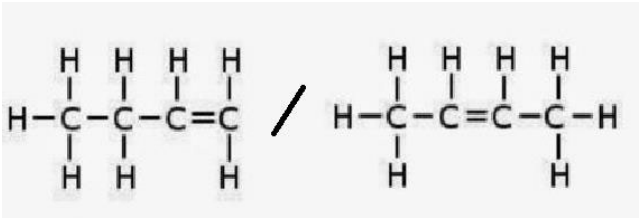


1

(any other)

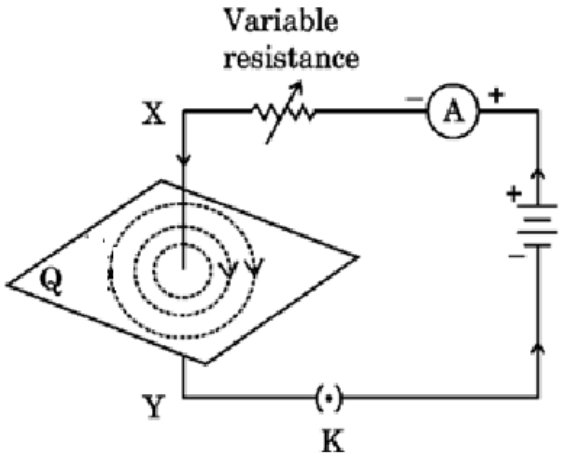
- It is used in the hydrogenation of vegetable oil. 1

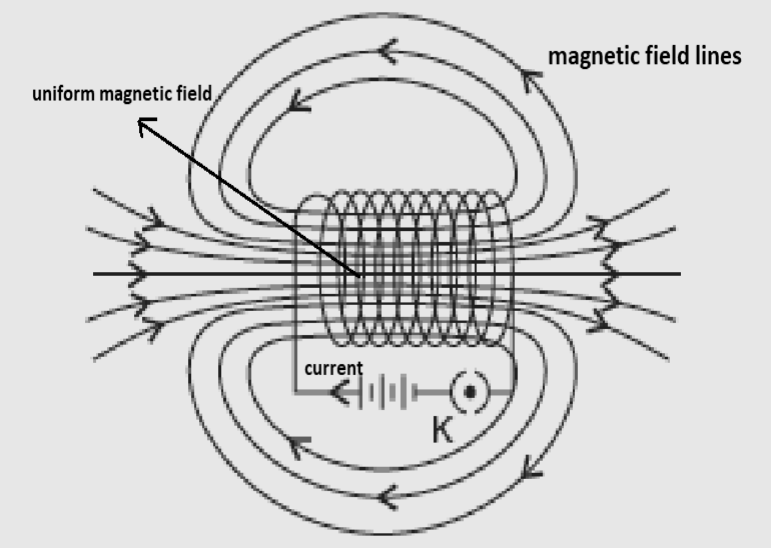
(iii) Butene ½



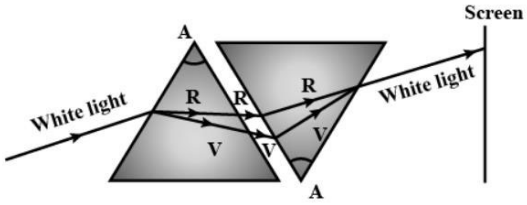
½

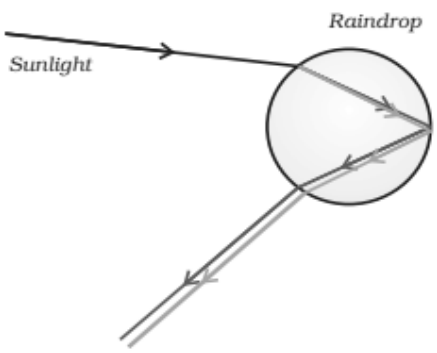
5

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.	1	
	• Out of the plane/ upwards	1	
	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 (H_3O^+/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/$Mg(OH)_2$	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.  (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