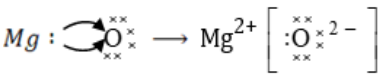
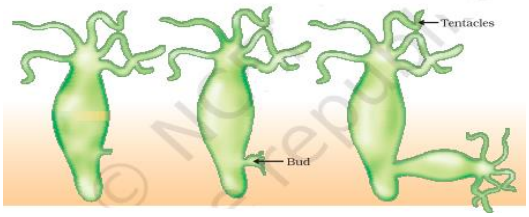
SECONDARY SCHOOL EXAMINATION, 2025

MARKING SCHEME

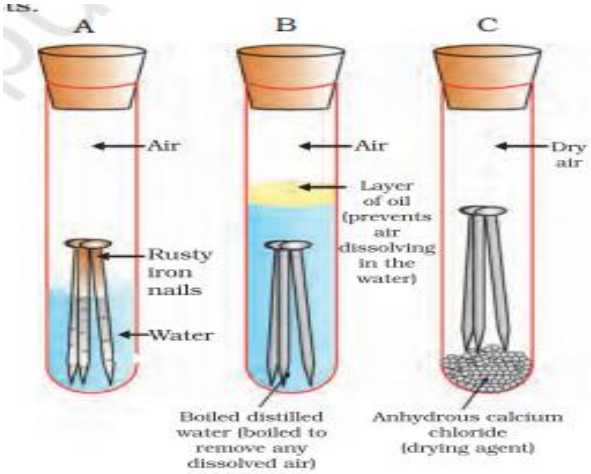
CLASS: X SCIENCE (Subject Code–086)

[Paper Code: 31/1/1]

Maximum Marks: 80

Q. No.	EXPECTED ANSWERS / VALUE POINTS	Marks	Total Marks
	SECTION A		
1.	D /1: 8	1	1
2.	B / Al_2O_3 and MgO	1	1
3.	D / Weak acid, neutral, strong base, strong acid	1	1
4.	A / Salt and water is formed	1	1
5.	C / It has weak electrostatic forces of attraction between its oppositely charged ions.	1	1
6.	B / Calcium and Magnesium	1	1
7.	A / 	1	1
8.	C / starch into simple sugars	1	1
9.	D / Auxins	1	1
10.	C / (i) and (iii)	1	1
11.	C / 100% round and yellow	1	1
12.	D / Cytoplasm and Oxygen deficient muscle cells	1	1
13.	A / (i) and (ii)	1	1
14.	B / Presbyopia and bifocal lens	1	1
15.	D / (ii) and (iv)	1	1
16.	D / 99%	1	1
17.	B / Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of Assertion (A).	1	1
18.	C / Assertion (A) is true, but Reason (R) is false.	1	1
19.	A / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1	1
20.	B / Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of Assertion (A).	1	1
	SECTION B		
21.	• Evolution of gas • Change / Rise in temperature	1 1	2
22.	 diagram labelling	1 1	2

23.	(a) • Plugging of the leak in blood vessels prevents lowering of the blood pressure / maintains the efficiency of the pumping system. • Platelets • Help to clot the blood at the site of injury. **OR** (b) (i) Plants have low energy needs because they have a large proportion of dead cells in many tissues / Plants have low energy needs as they do not move (ii) Translocation of soluble products of photosynthesis from leaves to other parts of the plant / It transports amino acids and other substances to storage organs of roots, fruits and seeds and to growing organs.	1 ½ ½ 1 1	2
24	u = - 60 cm f = -30 cm $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{-30\ cm} = \frac{1}{v} - \frac{1}{-60\ cm}$ $\frac{1}{v} = \frac{1}{-30} - \frac{1}{60}$ $\frac{-3}{60\ cm} = \frac{1}{v} \Rightarrow$ v = – 20 cm Position of image is 20 cm from a concave lens.	½ ½ 1	2
25.	(a) Resistance of each part = $\frac{R}{3}$ $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ $\frac{1}{R_p} = \frac{1}{R/3} + \frac{1}{R/3} + \frac{1}{R/3}$ $\frac{1}{R_p} = \frac{3}{R} + \frac{3}{R} + \frac{3}{R} = \frac{9}{R}$ $\Rightarrow R_p = \frac{R}{9}$ **OR** (b) • Electric power is the rate at which electrical energy is	½ ½ ½ ½ 1	

	consumed or dissipated in an electrical circuit. / Electric power is electrical energy consumed per unit time. • When 1A current at 1V potential difference flows in a circuit. / Power consumed is 1W when 1J electrical energy is consumed in 1 s.	1	2
26.	Chemicals/pesticides used by farmers get washed down into the soil or water bodies and affect biotic and abiotic components of the ecosystem. These chemicals are mostly non-biodegradable and get accumulated progressively at each trophic level (Biological magnification). Thus, the health of the organisms of all trophic levels is affected.	2	2
	SECTION C		
27.	(a) $3\,MnO_2(s) + 4\,Al(s) \longrightarrow 3\,Mn(l) + 2\,Al_2O_3(s) + heat$ $Fe_2O_3(s) + 2\,Al(s) \longrightarrow 2\,Fe(l) + Al_2O_3(s) + heat$ **(Award marks if explained through statement or any other reactions.)** (b) Metals towards the top of the reactivity series (Na, Mg, Ca) have more affinity for oxygen than carbon.	1 1 1	3
28.	(a) ➢ Take three test tubes and place clean iron nails in each of them. ➢ Label these test tubes A, B and C. ➢ Pour some water in test tube A and cork it. ➢ Pour boiled distilled water in test tube B, add about 1 mL of oil and cork it. The oil will float on water and prevent the air from dissolving in the water. ➢ Put some anhydrous calcium chloride in test tube C and cork it. Anhydrous calcium chloride will absorb the moisture, if any, from the air. Iron nails rust in test tube A, but they do not rust in test tubes B and C. Rusting of iron takes place when exposed to both air and water. /  	3	

<table>
<tr><td></td><td>Iron nails rust in test tube A, but they do not rust in test tubes B and C.
Rusting of iron takes place when exposed to both air and water.

(Note: if a student explains activity through description or through labelled diagram, award full marks.)

OR

(b) (i)
• Sodium, Potassium, Lithium
(any two)
• Observations:
➢ A violent reaction occurs.
➢ Large amount of heat is evolved.
➢ Evolved gas may catch fire.

(ii) The gas (bubbles) burns with a pop sound</td><td>½,½

1 ½

½</td><td>3</td></tr>
<tr><td>29.</td><td>(a) Plant cells use electrical– chemical means to convey information. /The information that touch has occurred must be communicated

(b) Plant cells change shape by changing the amount of water in them (swelling or shrinking).

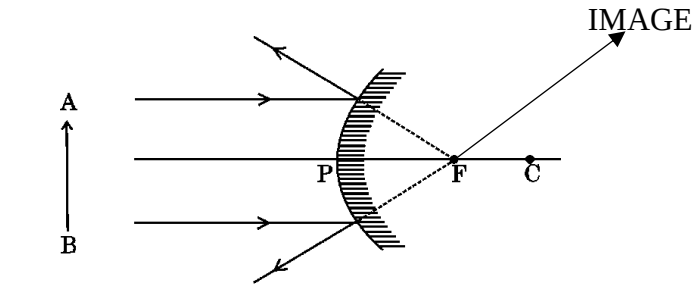
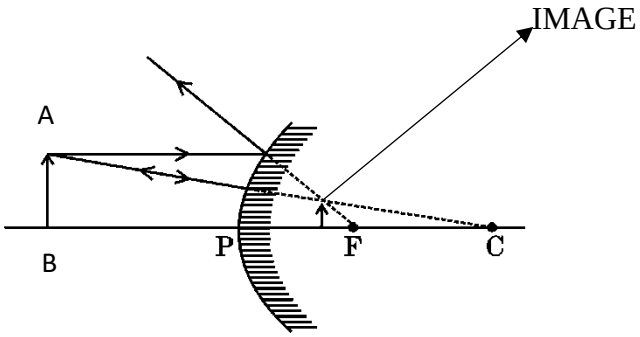
(c)
<table><tr><td>Movement in touch-me-not Plant</td><td>Movement of tendrils in pea plant</td></tr><tr><td>It is growth independent</td><td>It is growth dependent</td></tr><tr><td>It does not take place in the direction of stimulus</td><td>It takes place in the direction of stimulus</td></tr><tr><td>It is also called as nastic movement.</td><td>It is also called as tropic movement (any other)</td></tr></table>(Any one difference)</td><td>1

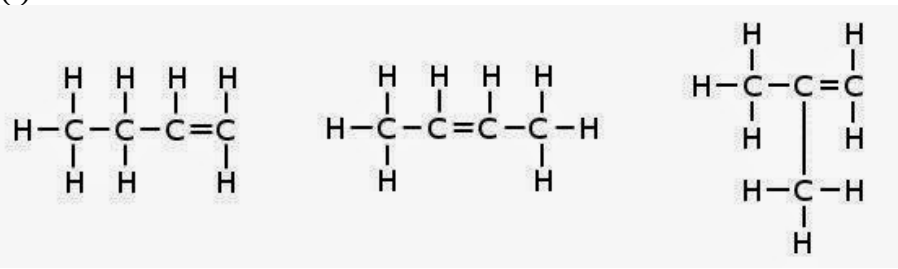
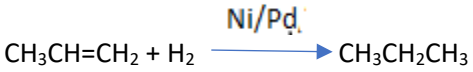
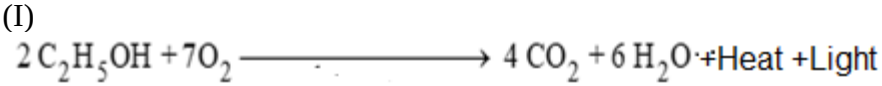
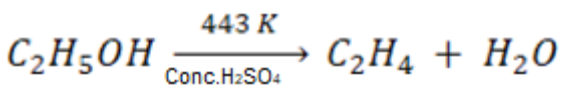
1

1</td><td>3</td></tr>
<tr><td>30.</td><td>(a)
Chromosomes carry genes which control the traits of an organism/chromosomes contain information for inheritance of features from parents to next generation in the form of DNA(Deoxy ribonucleic acid) molecule.
(b)
• Each cell has two copies of each chromosome, one from male and the other from female parents which get halved during the formation of germ cells/gametes.
• After fusion of the germ cells zygote is formed which restores the normal number of chromosomes and the same amount of DNA in the progeny.</td><td>1

1

1</td><td>3</td></tr>
</table>

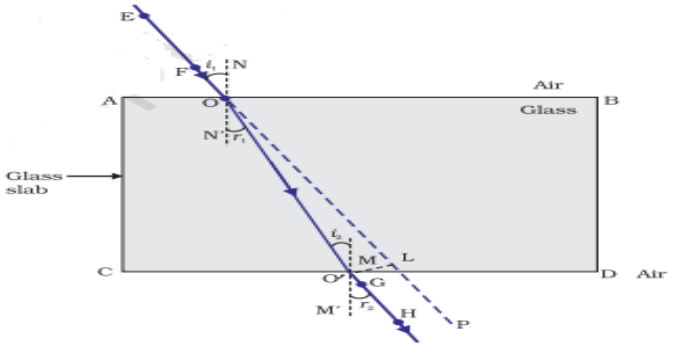
31.	(i)  OBJECT (ii)  OBJECT **(Note: Deduct ½ mark if arrows are not drawn.)**	1 ½ 1 ½	3
32.	(a) $\frac{1}{R_1} = \frac{1}{10\,\Omega} + \frac{1}{15\,\Omega} = \frac{1}{6\,\Omega} \Rightarrow R_1 = 6\ \Omega$ $\frac{1}{R_2} = \frac{1}{60\,\Omega} + \frac{1}{40\,\Omega} = \frac{100}{2400\,\Omega} \Rightarrow R_2 = 24\ \Omega$ $\because$ R_1 and R_2 are in series $\therefore$ $R_{total} = R_1 + R_2 = (6 + 24) = 30\ \Omega$ (b) V = IR $\Rightarrow$ $I = \frac{V}{R} = \frac{15\,V}{30\,\Omega} = 0{\cdot}5$ A (c) $V = IR_1 = 0{\cdot}5\ A \times 6\ \Omega = 3{\cdot}0$ V	1 1 1	3
33.	(a) • $R = \rho \frac{l}{A}$ $\rho = \frac{RA}{l}$ • SI unit of $\rho = \frac{ohm \times (metre)^2}{metre}$ = ohm meter	1 ½ ½	

	(b) Resistivity of alloy is higher than pure metals. / They do not oxidise (burn) readily at high temperatures.	1	3
	SECTION D		
34.	(a) (i)  **(any two)**	½, ½	
	(ii) (I) Chloropropane (II) Butanone/ Butan-2-one	½ ½	
	(iii) (I) 	1	
	(II) 	1	
	(III) $CH_3COOH + C_2H_5OH \xrightarrow{Acid} CH_3COOC_2H_5 + H_2O$	1	
	OR		
	(b) (i) X = Ethanol/ Ethyl alcohol/ C_2H_5OH Y = Sodium ethoxide/ C_2H_5ONa Z = Hydrogen/H_2	½ ½ ½	
	$CH_3CH_2OH + Na \longrightarrow CH_3CH_2ONa + \frac{1}{2}H_2$ X Y Z	½	
	(ii) (I) 	1	
	(II) 	1	

	(III) $C_2H_5OH \xrightarrow{Acidified\ K_2Cr_2O_7} CH_3COOH$ **(No mark to be deducted if equations are not balanced.)**	1	5
35.	(a) (i) (I) Ovary: Produces female gamete (egg) and female hormones(oestrogen). (II) Fallopian tube: Site of Fertilization (III) Uterus: Site of Implantation and embryonic development. (ii) Methods of contraception used by males: • Mechanical barrier - Condoms • Surgical method – blocking the vas deferens in males (Vasectomy) **OR** (b) (i) Self-pollination: Pollen grains are transferred from stamen to the stigma of the same flower. Cross-pollination: Transfer of pollen grains from stamen of one flower to the stigma of another flower of same species. (ii) A – Stigma: Receives pollen and provides suitable environment for its germination. B –Pollen tube: Carries males germ cells (gametes) to the female gamete situated in the ovary. C – Egg Cell (Female germ cell): Fuses with male gamete and forms zygote.	½,½ 1 1 1 1 1+1 1 1 1	5
36.	(a) (i) • Concave lens • P = $\frac{1}{f(m)}$ $-2{\cdot}5 = \frac{1}{f}$ f = $\frac{10}{-2{\cdot}5}$ = – 0·4 m = – 40 cm • Myopia (ii) (I) Real and inverted (II) magnified image /size of image is double the size of object (III) beyond 2F/ on the other side as that of object (IV) Negative (iii) • The lens with focal length 10 cm • less focal length, more converging/diverging power	½ ½ ½ ½ ½×4 ½ ½	

OR

(b) (i)



(if arrows not marked , deduct half mark) — 2

(ii) The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for a given pair of media. / — 1

$$\frac{\sin i}{\sin r} = constant$$ — 1

(iii)

Convex Lens	Concave Lens
(I) Object to be placed between O and F	Object can be placed anywhere in front of the lens
(II) Magnified image	Diminished image

1 — 5

SECTION E

37. (a) $2\,NaCl + 2\,H_2O \xrightarrow{electricity} 2\,NaOH + H_2 + Cl_2$ — 1

(b)
Uses of NaOH : Degreasing metals/ Soaps and Detergents/ paper making/ artificial fibres/ preparation of bleach
Uses of H_2: As fuel/ Margarine/ In preparation of ammonia for fertilizers/Preparation of HCl
Uses of Cl_2 : Disinfectant/ PVC/ water treatment/ in swimming pools/ CFC's/ preparation of bleach/ preparation of HCl/ pesticides
(Any two uses of anyone product) — ½,½

(c) (i) A – $NaHCO_3$/ Sodium Hydrogen Carbonate/ Baking soda — ½

B – Na_2CO_3 / Sodium Carbonate — ½

$$\underset{A}{2\,NaHCO_3} \xrightarrow{heat} \underset{B}{Na_2CO_3} + H_2O + CO_2$$ — 1

OR

(c) (ii) • The fixed number of water molecules present in one formula unit of a salt. — 1

- $CuSO_4.5H_2O$/Copper Sulphate pentahydrate/Blue vitrol
- $CaSO_4.2H_2O$/Gypsum/Calcium sulphate dihydrate
- $Na_2CO_3.10H_2O$/Washing Soda/Sodium carbonate decahydrate

	• $FeSO_4.7H_2O$/ Green Vitrol/Ferrous sulphate hepta hydrate • $CaSO_4$. ½ H_2O/ Calcium Sulphate hemihydrate /POP **(Any two examples)**	½,½	4
38.	(a) Photosynthesis A process by which green plants capture sunlight and convert it to chemical energy with the help of chlorophyll / Process by which carbon dioxide and water is converted into carbohydrates in the presence of sunlight chlorophyll and water. (b) $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 6H_2O$ (c) (i) • Absorption of light energy by chlorophyll • Conversion of light energy to chemical energy. • Reduction of carbon dioxide to carbohydrates. • Desert plants take up CO_2 at night and prepare intermediate, which is acted upon by the energy absorbed by the chlorophyll during the day. **OR** (c) (ii) (I) Decrease the rate of photosynthesis due to low amount of sunlight. (II) Decreases the rate of photosynthesis due to reduced gaseous exchange.	½ ½ 1 2 1 1	4
39.	(a) Live wire- Red Neutral wire- Black (b) Power, P = 1 kW = 1 × 1000 W = 1000 W Voltage, V = 220 V Current drawn I =? $P = V \times I$ $I = \frac{1000\ W}{220\ V} = 4{\cdot}54$ A Current rating should be of 5A. (c) (i) • The earth wire provides a low resistance conducting path for the current which ensures that any leakage of current to flow to the metallic body of the appliances, keeps its potential to that of the earth. • The user will not get an electric shock. **OR** (c) (ii) • Fuse wire • Earth wire • A fuse in a circuit prevents damage to the circuit due to overloading. • Earth wire prevents electric shock due to leakage of current.	½ ½ ½ ½ 1 1 ½ ½ ½ ½	4