MARKING SCHEME

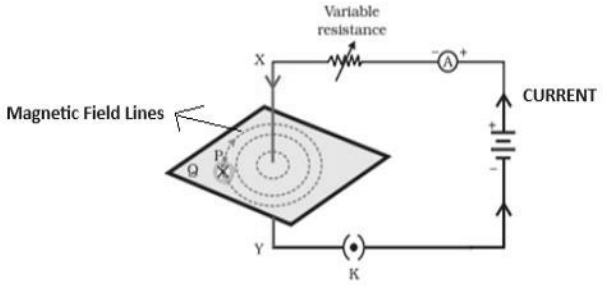
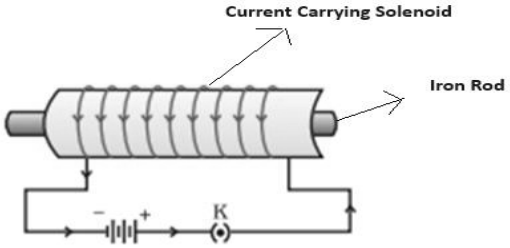
Secondary School Examination, 2024

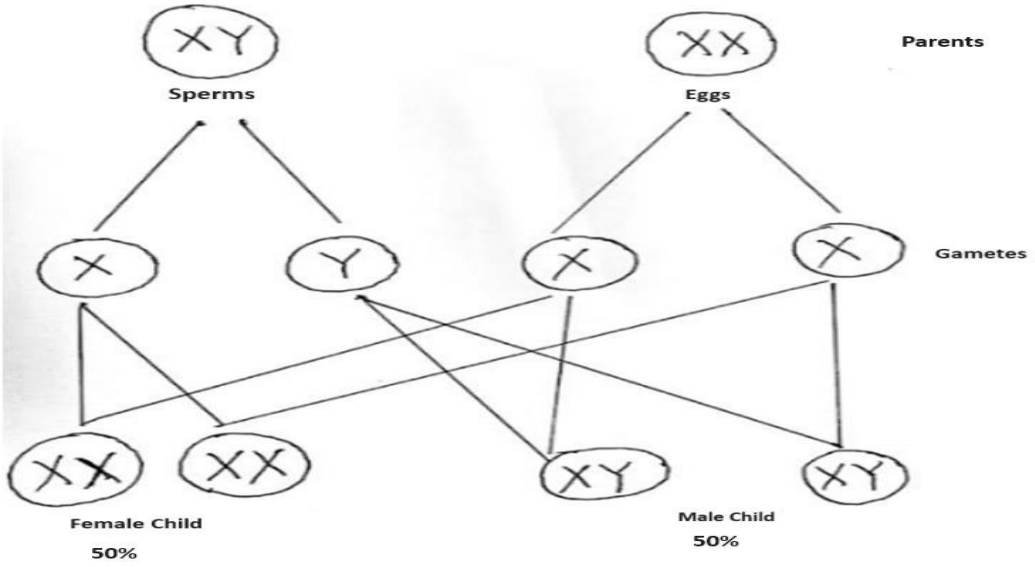
SCIENCE (Subject Code–086)

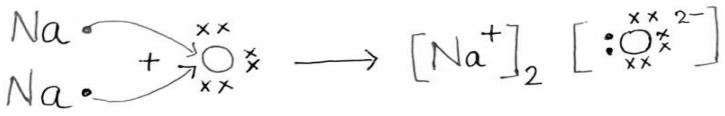
[Paper Code: 31/3/2]

Maximum Marks: 80

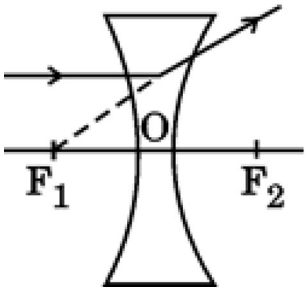
Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION A		
1	(A) / Washing Soda	1	1
2	(B) / $CaO + H_2O \rightarrow Ca(OH)_2$	1	1
3	(A) / Quick lime	1	1
4	(B) / Turmeric and litmus	1	1
5	(B) / $C_7 H_{14}$	1	1
6	(C) / $CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$	1	1
7	(A) / 1, 6, 2 and 3	1	1
8	(D) / 4D and 2L	1	1
9	(D) / Reduce CFC production	1	1
10	(D) / They reproduce asexually	1	1
11	(A) / Tt and Tt	1	1
12	(C) / (b) and (c)	1	1
13	(C) / Petals only	1	1
14	(D) / Dispersion, refraction and internal reflection	1	1
15	(B) / (a) and (c)	1	1
16	(A) / 2 trophic levels	1	1
17	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)	1	1
18	(C) / Assertion (A) is true, but Reason (R) is false	1	1
19	(D) / Assertion (A) is false but Reason (R) is true.	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	(a) $BaCl_{2\,(aq)} + Na_2SO_{4(aq)} \rightarrow 2NaCl\,(aq) + BaSO_4\,(s)$ (b) • Double displacement reaction • As exchange of ions takes place	1 ½ ½	2
22	• When he can not see nearby objects distinctly but can see far object clearly. • 2 causes: Focal length of the eye lens is too long. Eyeball becomes too small. • Convex or Converging lens	½ ½ ½ ½	2

23	(a)  Fig.12.6(a) on page 199-NCERT **Diagram:** **Directions of current and magnetic field:** **OR** (b) • Permanent magnet / Current carrying solenoid/ Electromagnet •  Fig-12.11, page no.201-NCERT **Diagram:** **Labelling:**	1 ½+½ ½ 1 ½	2
24	• Synthesized at shoot tip/root tip • When light falls on one side of the plant, auxin diffuses towards the shady side of shoot. The concentration of auxin stimulates the cells to grow longer on the side of shoot which is away from light. Thus, plant appears bent towards light/phototropism.	½ 1½	2
25	(a) 2 visible characters of garden pea plants are : • Tallness (dominant), Dwarfness (recessive) • Yellow seeds (dominant), Green seeds (recessive) **(Any other pair)**	½ + ½ ½ + ½	

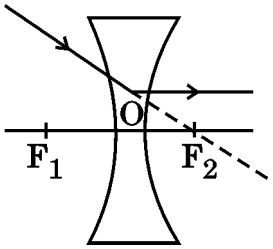
	OR (b)  	½ ½ ½ ½	2
26	• Biodegradable – Substances that are broken down by biological processes. • Non-biodegradable –Substances that are not broken down by biological processes. **Classification:-** Biodegradable – Newspaper, Vegetable peels Non-biodegradable – Glass bottles, Polythene bags	½ ½ ½ ½	2
	SECTION C		
27	(a) (i) **Reduction Process-** Roasting **Reason-** Mercury has low reactivity. (ii) **Reduction Process-** Roasting **Reason-** Copper has low reactivity. (iii) **Reduction Process-** Electrolytic Reduction. **Reason-** Sodium has high reactivity . **OR** (b) (i) **Change in appearance -** White to black colour. **Reason-** Silver sulphide is formed.	½ ½ ½ ½ ½ ½ ½+½	

	(ii) **Change in appearance –** Reddish brown to green colour. **Reason-** Basic Copper Carbonate is formed. **(iii) Change in appearance-** Grey to brown colour. **Reason-** Rust (iron oxide) is formed.	½+½ ½ +½	3
28	Na = 2, 8, 1; O = 2,6  • Cation – Sodium Anion – Oxide	½+½ 1 ½ ½	3
29	(a) Constituents:- Brain and Spinal cord. Protection:- Brain – Bony box/in skull/Cranium/fluid filled balloon Spinal Cord – Vertebral column. (b) Limitations : (i) They will reach only those cells that are connected by nervous tissue, not each and every cell in the animal body. (ii) Once an electrical impulse is generated in a cell and transmitted, the cell will take some time to reset its mechanisms before it can generate and transmit a new impulse. **(Any other)**	½ + ½ ½ ½ ½ ½	3
30	• Difference : Common pathway for aerobic and anaerobic respiration Glucose → Pyruvate Glucose→Pyruvate $\xrightarrow[O_2]{\text{Presence of}}$ Carbon dioxide+Water + Energy Site – in mitochondria	½ +½ ½ 1 ½	3
31	• It prevents damage to the appliances and the electrical circuit from overloading and short circuiting. •	1	

Aerobic Respiration	Anaerobic Respiration
Utilises Oxygen	Takes place in the absence of Oxygen

	Here P = 3 kW = 3000 W, V = 220 V, I = ? P = V I $I = \frac{P}{V} = \frac{3000\ W}{220\ V} = 13{\cdot}63$ A 13·63 A > Rating of fuse 5 A, therefore fuse wire will melt and break the circuit.	½ 1 ½	3
32	• Scattering of light / Tyndall effect • When a beam of light strikes fine particles of smoke, it is reflected diffusely and the path of the light becomes visible. • Very fine particles scatter mainly blue light/short wavelength colours while the particles of larger size scatter longer wavelength colours.	1 1 1	3
33	• Each electrical appliance has its own switch due to which each one can be turned ON and OFF separately, as per their requirement. • If due to some defect one electrical appliance stops working, then all other appliances keep working. • Each appliance has equal potential difference and draws the required amount of current. • The total resistance in a parallel circuit is decreased. **(Any three)**	1 1 1	3
	SECTION E		
34	(a) (i) (1)  Fig.9.13(b)-Page-153, NCERT.	1	

(2)



1

Fig.9.14(b)-Page-154, NCERT.

(Note:- Deduct half mark if directions of rays are not shown)

(ii) Given $u = -16$ cm, f = + 24 cm, h = 4 cm ½

Formula used $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ ½

$$\therefore \frac{1}{v} - \frac{1}{(-16)} = \frac{1}{+24}$$

$$\frac{1}{v} = \frac{-1}{48}$$

$v = -48$ cm 1

Image is formed on the same side as the object

$$m = \frac{h'}{h} = \frac{v}{u}$$ ½

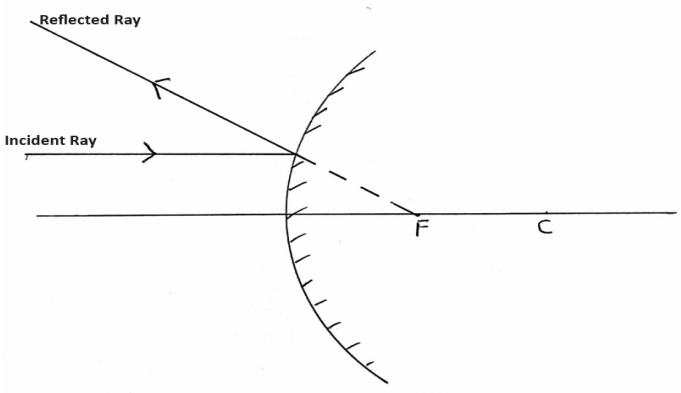
$$\frac{h'}{4} = \frac{-48}{-16}$$

h' = 12 cm ½

5

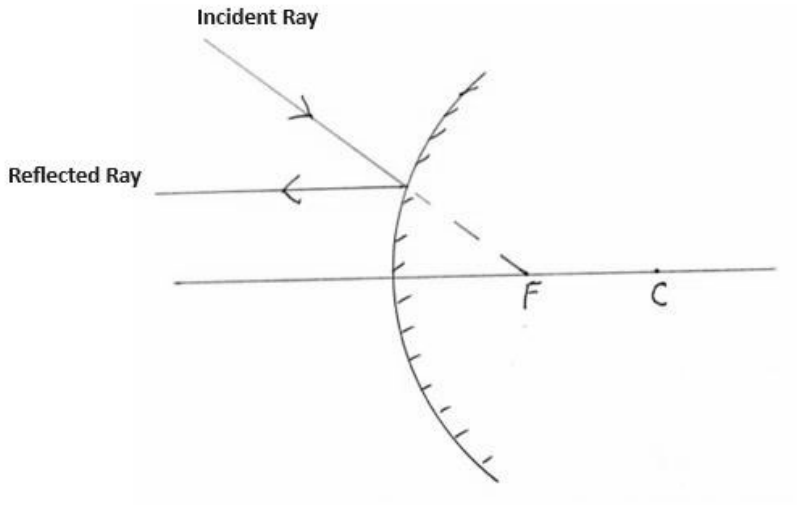
OR

(b) (i)
(1)



1

(2)



1

(Note:- Deduct half mark if directions of rays are not shown)

(ii) Here f = – 12 cm, u = – 18 cm, v = ?, h = 1·5 cm, h′ = ? ½

Mirror formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ ½

$$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$= \frac{1}{-12 \text{ cm}} - \frac{1}{-18 \text{ cm}}$$

$$= \frac{-1}{36}$$

$\therefore$ v = – 36 cm 1

$$m = \frac{h'}{h} = -\frac{v}{u}$$ ½

$$\frac{h'}{1.5} = -\frac{(-36)}{(-18)}$$

h' = – 3·0 cm ½

35	(a) • When the rate of general body growth begins to slow down and reproductive tissue begins to mature. • In boys – New thick hair growth on face, voice begins to crack, penis begins to enlarge and become erect. **(Any two)** (b) Testis – Formation of sperms, Secretion of hormone testosterone Role of : (i) Vas deferens – Delivery of sperms from testes to urethra. (ii) Seminal vesicle – Provides nutrition to sperms /makes the transport(movement) of sperms easier. (iii) Urethra – Common passage for sperms and urine. (iv) Scrotum – Providing required temperature for sperm formation **OR** (a) (i) Ovary – • Production of Estrogen hormone • Production of female gamete /egg (ii) Oviduct – • Transfer of female gamete from the ovary to uterus • Site of fertilisation (iii) Uterus – • Implantation of zygote • Nourishment of the developing embryo (b) Structure of Placenta – • Disc like structure embedded in the uterine wall connected to the embryo. • It has villi on the embryo's side and blood spaces on the mother's side.	1 ½+½ ½ ½ ½× 4 ½ ½ ½ ½ ½ ½ ½× 2	5

	Function : • Provides a large surface area for nutrients (glucose and oxygen) to pass from the mother's side to embryo, waste substances from embryo's side to mother's blood.	1	
36	(a) (i) (1) Solution B (2) Solution C (3) Solution A (4) Solution D (5) Solution E Increasing Order of H^+ ion concentration – C < E < D < A < B (ii)(1) Acidic salt : (Ammonium chloride) NH_4Cl **Parent Acid-**Hydrochloric acid /HCl **Parent Base-** Ammonium hydroxide/(NH_4OH) (2) Basic salt : **(**Sodium Carbonate) Na_2CO_3 **Parent Acid-**Carbonic acid / H_2CO_3 **Parent Base-** Sodium hydroxide / NaOH **(Or Any other)** **OR** (b) Chlor – alkali process; • When electricity is passed through NaCl (aq) it decomposes to form sodium hydroxide / $2NaCl + 2H_2O \rightarrow 2NaOH+Cl_2+H_2$ • X – Cl_2 gas – at anode • Y – H_2 gas – at cathode ***(award marks if explained by diagram)*** • Z – Bleaching powder / $CaOCl_2$ / Calcium Oxychloride • $Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$ (Bleaching powder)	½ x 5 ½ ½ ½ ½ ½ 1 ½ ½+ ½ ½ +½ ½ 1	5
	SECTION E		
37	(a) • CH_3Br • C_2H_5Br (b) (i) Aldehyde (ii) Ketone	½ ½ ½ ½	

	(c) • The colour of $KMnO_4$ disappears; • $KMnO_4$ acts as an oxidizing agent. • $CH_3CH_2OH \xrightarrow{Alkaline\ KMnO_4+Heat} CH_3COOH$ **OR** (c) • Ethene Conc. H_2SO_4 acts as a dehydrating agent. • $C_2H_5OH \xrightarrow[443\ K]{Conc.\ H_2SO_4 + Heat} CH_2 = CH_2 + H_2O$	½ ½ 1 ½ ½ 1	4
38	(a) Salivary glands; Starch / Carbohydrate (b) Stomach, Anus (c) (i) The inner lining of the stomach will not be protected from the action of acid. (ii) Digested food will not be absorbed / Absorption area will be reduced. **OR** (c) • Emulsification of fats. • Acidic medium has to be made alkaline for the pancreatic enzymes to act.	½ + ½ ½ +½ 1 1 1 1	4
39	(a) (i) Bulb A glows (ii) Bulbs B, C, D and E glow (b) P = V×I 11 = 55 ×I I = $\frac{1}{5}$ = 0.2 amp (c) (i) Resistance of bulb B, R = $\frac{V}{I} = \frac{55\ V}{0.2\ A} = 275\ \Omega$ **(alternative formula for calculation R = $\frac{V^2}{P}$)**	 ½ ½ ½ ½ 1	

	(ii) Total resistance of the series combination of four bulbs $= 4 \times 275 = 1100\ \Omega$	1	
	OR		
	(c) • Bulb A will keep glowing with same brightness.	½	
	• Other bulbs i.e., B, D and E will stop glowing.	½	
	Reason: As the bulbs B, D and E are connected in series with fused bulb C, so no current flows through them and thus they will not glow. The bulb A remains unaffected as it is connected in parallel combination.	1	4

*****