MARKING SCHEME
SCIENCE (Subject Code-086)
(PAPER CODE: 31/1/1) (10-01-86K)

<table>
<tr><th>Q.No.</th><th>EXPECTED OUTCOMES/VALUE POINTS</th><th>Marks</th><th>Total Marks</th></tr>
<tr><td colspan="4">SECTION – A
(Biology)</td></tr>
<tr><td>1.</td><td>(B) / Stomata</td><td>1</td><td>1</td></tr>
<tr><td>2.</td><td>(D) / Binary Fission</td><td>1</td><td>1</td></tr>
<tr><td>3.</td><td>(D) / they reproduce asexually</td><td>1</td><td>1</td></tr>
<tr><td>4.</td><td>(B) / Cerebellum</td><td>1</td><td>1</td></tr>
<tr><td>5.</td><td>(B) / Trypsin digests proteins and lipase digests emulsified fats.</td><td>1</td><td>1</td></tr>
<tr><td>6.</td><td>(A) / (ii) and (iii)</td><td>1</td><td>1</td></tr>
<tr><td>7.</td><td>(C) / Polythene bag, rubber band, ball pen</td><td>1</td><td>1</td></tr>
<tr><td>8.</td><td>(A) / Both, Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).</td><td>1</td><td>1</td></tr>
<tr><td>9.</td><td>(C) / Assertion (A) is true, but Reason (R) is false.</td><td>1</td><td>1</td></tr>
<tr><td>10.</td><td>• The main function of the diaphragm is to flatten during inhalation, which expands the chest cavity and draws the air into the lungs / helps in breathing.
• It is located at the base of chest cavity.</td><td>1
1</td><td>2</td></tr>
<tr><td>11.</td><td>(a)
<table>
<tr><th>Chewing of food</th><th>Salivation on sight of food</th></tr>
<tr><td>i) It is a voluntary action.</td><td>i) It is a reflex/involuntary action.</td></tr>
<tr><td>ii) It is controlled by forebrain.</td><td>ii) It is controlled by medulla in the hind brain.</td></tr>
</table>
(any other suitable difference)
OR
(b)
<table>
<tr><th>Pollination</th><th>Fertilization</th></tr>
<tr><td>i) It is the transfer of pollen grains from anther to the suitable stigma.</td><td>i) It is the fusion of male gamete with the female gamete.</td></tr>
<tr><td>ii) It occurs in plants.</td><td>ii) It occurs in both plants and animals.</td></tr>
</table>
(any other suitable difference)</td><td>1
1
1
1</td><td>2</td></tr>
</table>

12.

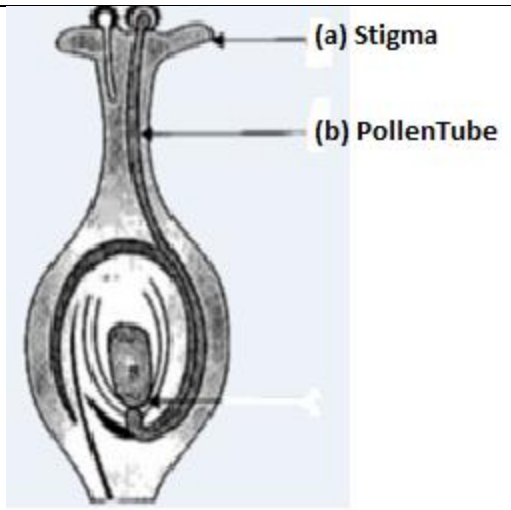


Diagram — **1**

(a) Stigma — **½**
(b) Pollen Tube — **½**

2

13.

(a) (i) Grass
(ii) Deer, Rabbit — **1**
(iii) Snake, Lion
(iv) Lion

(b) Primary consumers feed on green plants which have large amount of energy. Only 10% of its energy is available/passed for the next secondary consumer /trophic level. — **1**

(c) The base is broad as the number/energy/mass of producers is usually the highest in comparison to other trophic levels of the pyramid. — **1**

3

14.

(a)

Nephron	Neuron
(i) Filtration/Structural/ Functional unit of the kidney. (ii) Filters nitrogenous wastes from the blood.	(i) Structural/ Functional unit of the nervous system. (ii) Transmits information from one part of the body to another.

(any one, any other suitable difference) — **1**

(b)

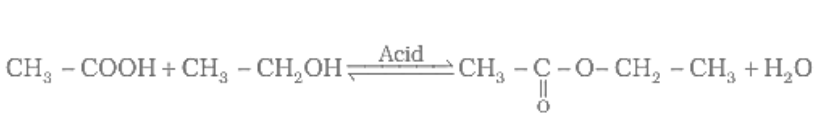
Sensory Nerve	Motor Nerve
(i) Carries impulse from receptors to CNS/ Brain and Spinal cord.	(i) Carries impulse from CNS/Brain and Spinal cord to the motor area/ effector organ.

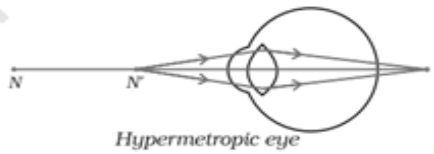
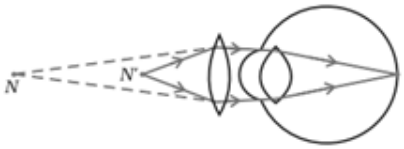
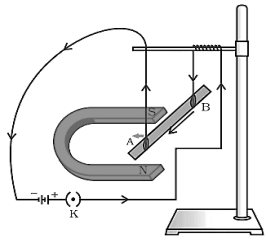
(any other suitable difference) — **1**

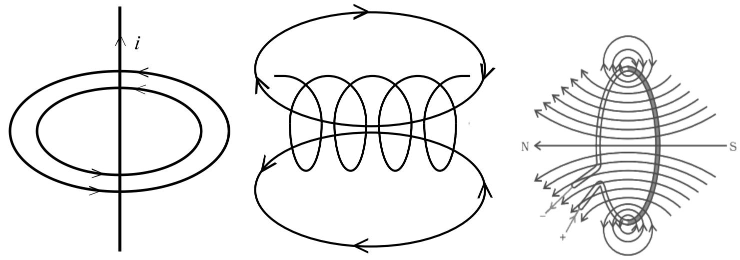
	(c) Consumers: (i) Organisms that feed on producers and other consumers. (ii) Transfer energy through the food chain. Decomposers: (i) Organisms that breakdown dead organic matter into simpler inorganic substances. (ii) Recycle nutrients back into the environment. (any one, any other suitable difference)	**1** **3**	
15.	(a) In F_1 progeny, pea plants have 'Tt' where 'T' is dominant over 't' so all the plants of F_1 progeny were tall. / Tall height is dominant trait over short height. (b) Self-pollination (c) (i) Dominant trait: i) Expresses itself over recessive trait. ii) Expresses in both conditions-TT and Tt. Recessive trait: i) Unable to express itself in presence of a dominant trait. ii) Expresses itself only when it is 'tt' or in pure condition. (any one, any other suitable difference) **OR** (c) (ii) Mendel's observations: • All plants of F_1 progeny were tall. • No medium/ no short height plants observed in F_1 progeny. • F_1 progeny resembled one parent only. (any two observations)	**1** **1** **2** **1+1**	**4**
16.	(a) (i) Most of these bacteria would die, but the few variants resistant to heat would survive and grow further. (ii) Fertilization occurs to form a zygote. (iii) Cross pollination may occur leading to fruit formation. / No fertilization. / No fruit formation. (iv) If the egg is not fertilised, the thick and spongy lining of the uterus breaks and comes out through vagina as blood and mucus, known as menstruation. / Menstruation will take place. (v) The seed will develop into a seedling. / Germination will take place. **OR** (b) (i) When spores land on a substance and get adequate moisture and temperature, it will develop into new *Rhizopus*.	**1** **1** **1** **1** **1** **1**	

	(ii) New plants grow from the buds located in the notches of the leaf. (iii) The pollen tube will not be formed. / No fertilisation will take place. (iv) Fertilization /Pregnancy will be prevented. (v) Each fragment or piece grows into a new individual organism.	**1** **1** **1** **1**	**5**
	SECTION – B **(Chemistry)**		
17.	(C) / Both, (i) and (ii) are double displacement reactions and precipitation reactions.	**1**	**1**
18.	(B) / Vanilla essence	**1**	**1**
19.	(D) / NO_2 and O_2	**1**	**1**
20.	(B) / -CHO	**1**	**1**
21.	(A) / Pb	**1**	**1**
22.	(A) / tomato, curd, ant-sting	**1**	**1**
23.	(B) / Calcium	**1**	**1**
24.	(A) / Both, Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	**1**	**1**
25.	(a) Metal oxides which can react with both acids as well as bases to produce salt and water. (b) ZnO – Amphoteric oxide Na_2O – Basic oxide CO_2 – Acidic oxide	**1** **1**	**2**
26.	(a) • Substance oxidised - C • Substance reduced - ZnO (b) $Pb(NO_3)_2 + \mathbf{2}\ KI \rightarrow PbI_2 + \mathbf{2}\ KNO_3$ (c) • $2H_2O \xrightarrow{\text{electricity}} 2H_2 + O_2$ • $2AgCl \xrightarrow{\text{sunlight}} 2Ag + Cl_2$ (any other example in each case)	 ½ ½ **1** ½ ½	**3**
27.	(a) • When electricity is passed through brine, it decomposes to form sodium hydroxide (alkali) and chlorine, hence this process is called chlor-alkali process. $2NaCl(aq) + 2H_2O(l) \xrightarrow{\text{Electricity}} 2NaOH(aq) + H_2(g) + Cl_2(g)$ • At anode: Cl_2 • At cathode: H_2 **OR**	 **1** **1** ½ ½	

	(b) (i) $NaCl + H_2O + NH_3 + CO_2 \rightarrow NaHCO_3 + NH_4Cl$ (ii) $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$ / $2Ca(OH)_2 + 2Cl_2 \rightarrow Ca(ClO)_2 + CaCl_2 + 2H_2O$ (iii) $CaSO_4.2H_2O \xrightarrow{373K} CaSO_4.\frac{1}{2}H_2O + 1\frac{1}{2}H_2O$ (deduct ½ mark for no / incorrect balancing)	**1** **1** **1**	**3**
28.	(a) Because it is easier to obtain metal from its oxide. / Because it is easier to reduce metal oxide to metal (b) $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s) + Heat$ $3MnO_2(s) + 4Al(s) \rightarrow 3Mn(l) + 2Al_2O_3(s) + Heat$ (balancing is optional) (any one equation) (c) (i) $2Cu_2S + 3O_2(g) \xrightarrow{Heat} 2Cu_2O(s) + 2SO_2(g)$ $2Cu_2O + Cu_2S \xrightarrow{Heat} 6Cu(s) + SO_2(g)$ **OR** (c)(ii) (I) Because highly reactive metals have more affinity for oxygen than carbon. (II) Because of its low melting point.	**1** **1** **1** **1** **1** **1**	**4**
29.	(a) (i) (I) They do not give rise to charged particles/ ions. (II) Soap reacts with calcium and magnesium salts present in hard water and forms insoluble substances called Scum. (III) C-C bonds are strong and stable whereas Si-Si bonds are relatively weak. (ii) (I) $CH_3CH_2OH \xrightarrow{\text{acidified } K_2Cr_2O_7 + heat} CH_3COOH$ (II) $CH_2{=}CH_2 + H_2 \xrightarrow{Ni} CH_3\text{-}CH_3$ **OR** (b) (i) X - CH_3COOH/ethanoic acid /acetic acid Y - $CH_3COOC_2H_5$/$CH_3COOCH_2CH_3$/ ester/ ethyl ethanoate Z - CH_3COONa/sodium ethanoate/sodium acetate (ii) Catalyst/ dehydrating agent	**1** **1** **1** **1** **1** **½** **½** **½** **½**	

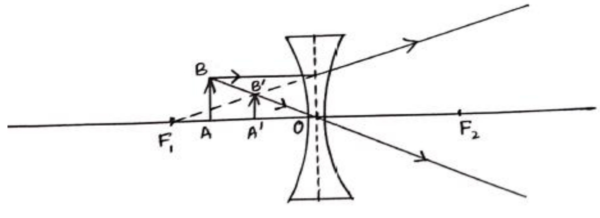
	(iii) •  • Esterification reaction • $CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$ • Saponification reaction/ De-esterification reaction	1 ½ 1 ½	5
	SECTION – C **(Physics)**		
30.	(C) / - 30 cm and + 30 cm from lens	**1**	**1**
31.	(A) / Ciliary muscles of your eye contract and the eye lens become thick	**1**	**1**
32.	(C) / Assertion (A) is true, but Reason (R) is false.	**1**	**1**
33.	(a) Convex lens / Converging lens (b) m = - 2, v= 30 cm $m = \frac{v}{u}$ $u = \frac{v}{m}$ $u = \frac{30}{-2}$ u = -15cm / The object was placed at 15 cm in front of the lens.	**1** ½ ½	**2**
34.	(a) r = 0.01 cm=1 x 10^{-4} m l = 1 cm = 0.01 m $R = \rho \frac{l}{A}$ $\rho = \frac{RA}{l} = \frac{R \times \pi r^2}{l}$ $\rho = \frac{7 \times 22 \times 10^{-8}}{7 \times 0.01}$ ρ = 22 x 10^{-8} x 10^{2} ρ = 22 x 10^{-6} Ωm =2.2 x 10^{-5} Ωm **OR** (b) Resistance of electric heater $R = \frac{V}{I}$ $R = \frac{220}{11}$ R = 20 Ω $P = \frac{V^2}{R}$ $P = \frac{200 \times 200}{20}$ P = 2000W/ 2 kW	½ 1 ½ ½ ½ ½ ½	**2**

35.	• Hypermetropia/ Far sightedness •  *Hypermetropic eye* •  *Correction for Hypermetropic eye* (deduct ½ mark for not showing the direction of ray of light)	**1** **1** **1**	**3**
36.	(a) **<u>Procedure</u>** Take a small aluminium rod AB and using two connecting wires suspend it horizontally from a stand. Place a strong horse-shoe magnet in such a way that the rod lies between the two poles perpendicularly. Connect the aluminium rod in series with a battery and a key. Now pass a current through the aluminium rod from one end to another. / **(Procedure can also be explained with a <u>Diagram)</u>**  **<u>Observation</u>** It is observed that the **rod is displaced** on passing current though it. (b) Magnetic field will be vertically downwards.	**1** **1** **1**	**3**

<table>
<tr><td>37.</td><td>(a)
 

(any two cases)
/
• Magnetic field pattern for a current carrying straight conductor- concentric circles.
• Magnetic field pattern for a current carrying solenoid- magnetic field lines similar to that of a bar magnet.
• Magnetic field pattern for a current carrying circular loop- a pair of concentric circles with parallel straight lines at the centre.
(any two cases)
(b)
• At X.
• Magnetic field decreases as the distance from the conducting wire increases.</td><td>1+1

½
½</td><td>3</td></tr>
<tr><td>38.</td><td>(a)
• Position - Image will form at 40 cm / 2F /C
• Nature – Real and inverted
/
Alternate answer
f = +20 cm, u = -40 cm
Using Lens Formula,
$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$
$\frac{1}{v} - \frac{1}{-40} = \frac{1}{20}$
$\frac{1}{v} = \frac{1}{20} + \frac{1}{-40}$
v = + 40 cm
Position - 40 cm on the other side of the lens
Nature - Real and inverted

(b)
 
</td><td>½
½

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

	(c) (i) f_1 = 30 cm = 0.3 m, f_2 = -15cm = -0.15 m $P = \frac{1}{f}$ $P_1 = \frac{+1}{0.3}$ D ; $P_2 = \frac{-1}{0.15}$ D Equivalent power, $P = P_1 + P_2$ P = - 3.33D Equivalent focal length, $f = \frac{1}{P}$ $f = \frac{-1}{3.33}$ = - 0.3 m = - 30 cm **OR** (c) (ii) • Combination Lens will behave like convex lens • f_1 = - 2 m, f_2 = 1.5 m $P = \frac{1}{f}$ $P_1 = \frac{-1}{2}$ D , $P_2 = \frac{+1}{1.5}$ D $P = P_1 + P_2$ $P = \frac{1}{6}$ f = + 6m The focal length of combination is positive. / **Alternate answer** • Combination Lens will behave like convex lens. • Convex lens - Less 'f', More 'P_1' Concave lens - More 'f', Less 'P_2' Combined Power = $P_1 + P_2$, which will be positive.	½ ½ ½ ½ **1** **1**	**4**
39.	(a) (i) As Resistance, $R = \rho \frac{l}{A}$, it changes with change in length and area of cross section of conductor. But resistivity of conductor is the characteristic property of material and hence it does not change. (ii) The resistivity of an alloy is generally higher than that of its constituent metals. / Alloys do not oxidise (burn) readily at high temperatures. (iii) 1 Ampere is constituted by the flow of 1 Coulomb of charge per second. / 1A= 1C/1s **OR**	**1** **1** **2** **1**	

	(b) (i) V= 4V, I= 2A Resistance of circuit R = $\frac{V}{I}$ R = $\frac{4}{2}$ R = 2Ω Let 'n' be the number of bulbs $\frac{1}{R} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + ---n$ $\frac{1}{R} = \frac{n}{8}$ $\frac{1}{2} = \frac{n}{8}$ n = 4 Therefore, 4 bulbs of resistance 8 Ω should be connected in parallel. (ii) • Ammeter • In series (iii) Heat generated through a current carrying conductor is directly proportional to square of current, resistance of conductor and time for which current flows in conductor. / $H = I^2 R t$	½ ½ ½ ½ 1 1 1	5