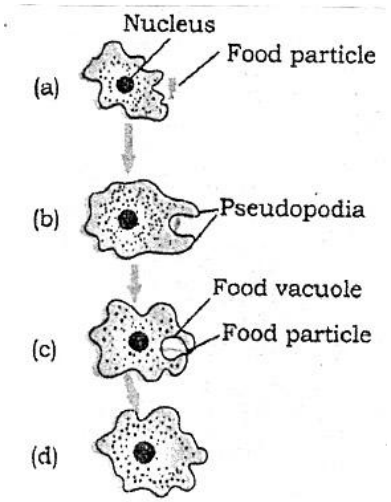
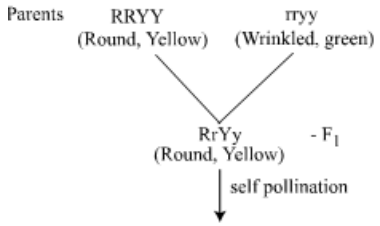
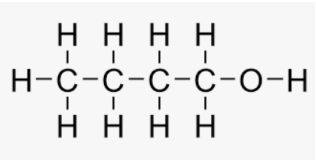
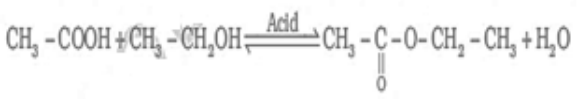
MARKING SCHEME
SCIENCE (Subject Code-086)
(PAPER CODE: 31/5/1) (10-05-86K)

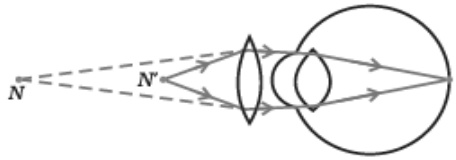
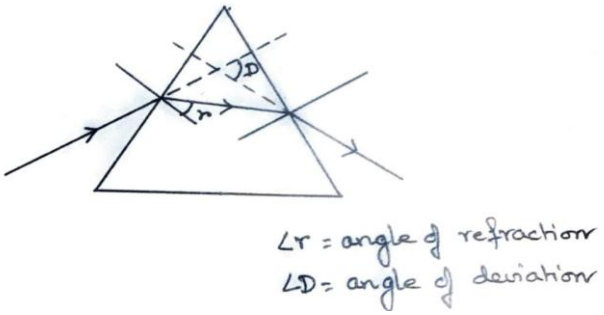
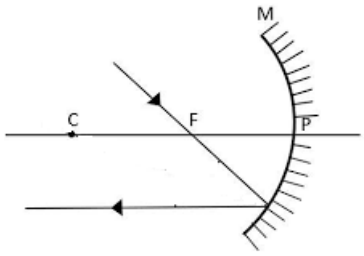
Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total marks
	SECTION – A **Biology**		
1.	(C)/ Guard cells	**1**	**1**
2.	(A)/ Pituitary gland	**1**	**1**
3.	(D)/ Glucose → pyruvate $\xrightarrow{\text{lack ofoxygen}}$ Lactic acid + Energy	**1**	**1**
4.	(C)/ Uterus	**1**	**1**
5.	(C)/ 44 + XY	**1**	**1**
6.	(B)/ DDT	**1**	**1**
7.	(B)/ Breakdown complex organic material into simple inorganic substances.	**1**	**1**
8.	(A)/ Both A and R are true and R is the correct explanation of A.	**1**	**1**
9.	(A)/ Both A and R are true and R is the correct explanation of A.	**1**	**1**
10.		**2**	**2**
11.	(A) P – Receptor/Skin Q - Sensory Neuron R - Relay Neuron S – Effector/Muscles in arm. **OR** (B) (i) Cytokinin (ii) Abscisic acid/ ABA (iii) Auxin (iv) Abscisic acid/ ABA	½ ½ ½ ½ ½ ½ ½ ½	**2**
12.	• Oxygenated blood from lungs comes to left atrium which pushes it to left ventricle → • Left ventricle contracts to push blood into aorta, to be sent to body parts → • Deoxygenated blood from body parts is collected and sent to right atrium →	½ ½ ½	

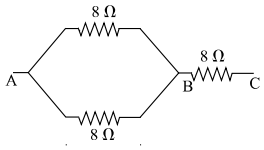
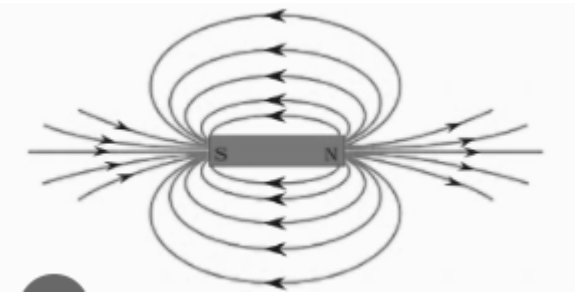
	• Right atrium pushes it to right ventricle, to be sent to lungs for oxygenation.	½	**2**
13.	•  RY Ry rY ry RY | RRYY | RRYy | RrYY | RrYy Ry | RRYy | RRyy | RrYy | Rryy rY | RrYY | RrYy | rrYY | rrYy Ry | RrYy | Rryy | rrYy | rryy • (i) RRYY – 1 (ii) rryy – 1	**1** **1** ½ ½	**3**
14.	(a) • Plastics being non - biodegradable persist in environment for a long time. (any other harmful effect) • Alternative - Jute or cloth bag (any other suitable alternative**)** (b) • Pesticides and chemical fertilizers are not biodegradable. They accumulate progressively at each trophic level. As human beings occupy the top level in any food chain the maximum concentration of these chemicals get accumulated in our bodies. • This Phenomenon is biological magnification.	½ ½ **1** **1**	**3**
15.	(a) • Structure → Bowman's capsule is a cup shaped end of a coiled tube (nephron) • Function → Bowman's capsule collects the filtrate from the blood. (b) Most of the water, salt, glucose, amino acids are selectively reabsorbed from the filtrate into the blood as the urine flows along the tubular part of nephron. (c) • Excretion is the process of removal of metabolic wastes/ nitrogenous waste/ urea/uric acid from the body. • It is essential for survival of a living organism as the excretory products are toxic and harmful to the organism.	½ ½ **1** **1** **1**	

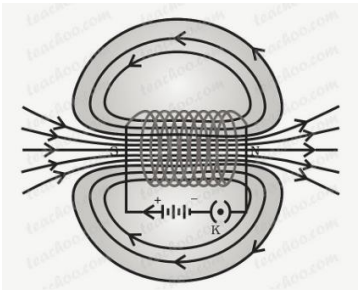
	OR (c) • Both lungs and kidneys remove metabolic waste / Lungs remove carbon dioxide gas (CO_2) from the blood while kidneys remove nitrogenous wastes like urea from the blood. • Both lungs and kidneys have thin-walled blood capillaries involved in exchange of gases and filtration of blood respectively.	**1** **1**	**4**
16.	(A) (i) (a) Zygote: It divides several times to form an embryo within the ovule. (b) Ovule: It develops a tough coat and is gradually converted into a seed. (c) Ovary: Grows rapidly and ripens to form a fruit. (d) Sepals: They shrivel and fall off. (ii) Germination is the process when the mature seed develops into a seedling under appropriate conditions. **OR** **(B)** (i) Vegetative propagation. (ii) Advantages: - • Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds. • Plants produced by vegetative propagation are genetically similar to the parent plant. • Plants that have lost the capacity to produce seed can reproduce by Vegetative propagation. (any two advantages) (iii) Roses, grapes, banana, orange, jasmine etc. (any other two examples) (iv) Regeneration is carried out by specialised cells. The organism which have those cells only can show regeneration.	**1** **1** **1** **1** **1** **1** **1+1** **½ + ½** **1**	**5**
	SECTION – B **Chemistry**		
17.	(B)/ 2: 1	**1**	**1**
18.	(D)/ C_4H_8 and C_5H_{12}	**1**	**1**
19.	(D)/ Al_2O_3	**1**	**1**
20.	(D)/ CH_3COONa | CH_3COOH | NaOH | Basic	**1**	**1**
21.	(C)/ C_3H_8	**1**	**1**
22.	(D)/ hydrochloric acid and sodium hydroxide	**1**	**1**
23.	(C)/ Hydrogen	**1**	**1**
24.	(A)/ Both A and R are true, and R is the correct explanation of A.	**1**	**1**

25.	(i) The substances whose odour changes in acidic or basic media. (ii) The fixed number of water molecules present in one formula unit of a salt.	**1** **1**	**2**
26.	(i) Brown fumes of nitrogen dioxide are formed. $2Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s) + 4NO_2(g) + O_2(g)$ (ii) Smell of burning sulphur is observed/ Colour of crystal changes. $2FeSO_4(s) \xrightarrow{Heat} Fe_2O_3(s) + SO_2(g) + SO_3(g)$ (iii) White silver chloride turns grey. $2AgCl\,(s) \xrightarrow{Sunlight} 2Ag(s) + Cl_2(g)$ (Note: Award full marks if balanced chemical equation is written)	½ ½ ½ ½ ½ ½	**3**
27.	(A) (a) • Calcium sulphate hemihydrate • $CaSO_4.\ \frac{1}{2}H_2O$ (b) $CaSO_4.\ 2H_2O \xrightarrow{373K} CaSO_4.\ \frac{1}{2}H_2O + \frac{3}{2}H_2O$ (c) Plaster of Paris is used for • making toys • to support fractured bones in right position. (or any other two uses) **OR** (B) (a) Methanoic acid/ Formic acid/ HCOOH. (b) (i) When acid is added to water, it does not cause excessive local heating/ does not cause splash out and burns. (ii) Baking soda, being alkaline in nature, neutralises excess acid in stomach and provides relief.	 ½ ½ **1** ½ ½ **1** **1** **1**	**3**
28.	(a) • $CH_3 - CH_2 - CH_2 - CH_2 - OH$ /  • Butanol (b) • Ethanol gets oxidised to form ethanoic acid. • $CH_3 - CH_2 - OH \xrightarrow{\text{alkaline } KMnO_4+heat} CH_3COOH$ (c)	½ ½ ½ ½	

	• 	1	
	• Esterification reaction.	1	
	OR		
	(c) • Ethanol will get dehydrated to form ethene. • $C_2H_5OH \xrightarrow{\text{Conc.}H_2SO_4 \text{ at } 443K} CH_2 = CH_2 + H_2O$ • Dehydrating agent/ Catalyst	½ ½ 1	4
29.	(A) (i) (I) A considerable amount of energy is required to break strong inter-ionic attraction. (II) Solder has low melting point. (III) Because Na or Mg have more affinity for oxygen than carbon. (ii) (I) Fe_2O_3/ Iron (III) oxide (II) Thermit reaction (III) $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s) + Heat$ (Deduct ½ mark if no/ incorrect balancing) **OR** (B) (i) (I) $2Cu_2O + Cu_2S \rightarrow 6Cu(s) + SO_2(g)$ (II) $2ZnS(s) + 3O_2(g) \rightarrow 2ZnO(s) + 2SO_2(g)$ (Deduct ½ mark if no/ incorrect balancing) (ii) (I) PVC provides insulation on the current carrying wires. (II) Copper does not react with cold water, hot water and steam. / Copper is a better conductor than steel. (iii) 	1 1 1 ½ ½ 1 1 1 1 1 1	5
	SECTION – C PHYSICS		
30.	(A) / 20 cm	1	1
31.	(A) / converging lens	1	1
32.	(D) / Assertion (A) is false but Reason (R) is true.	1	1
33.	(a) In optically rarer medium speed of light is more and in optically denser medium speed of light is less. (b) A < C < B	1 1	2
34.	**(A)** (i) While looking at objects nearer to eye, the curvature of the eye lens increases. Consequently, the focal length of the eye lens decreases. (ii) From 25cm (near point) to infinity (far point) **OR** **(B)**	1 1	

	 (Deduct ½ mark for not showing the direction of light)	**2**	**2**
35.	(a)  Diagram Labelling (b) • Angle of deviation will not change. • The ray of light will retrace its original path.	**1** **½ + ½** **½** **½**	**3**
36.	(a)  (b) (i) **Virtual Image formed by Convex mirror** / **Virtual Image formed by Concave mirror** Image is formed for all positions of the object / Image is formed when object is placed between Pole and Principal Focus Small/diminished / Enlarged/magnified (Any one difference) (ii) $m = -2$ $m = \frac{\text{height of image}}{\text{height of object}} = \frac{h'}{h}$ $h = \frac{h'}{m}$ $h = \frac{-20}{-2}$ $h = 10$ cm	**1** **1** **½** **½**	**3**

37.	(a) When the electric heater is switched on in a parallel circuit, it draws a large amount of current. As a result, the current through the bulb decreases, making the bulb glow dim. (b) •  • $\frac{1}{R_1} = \frac{1}{8} + \frac{1}{8}$ $R_1 = 4\Omega$ $R_{eq} = R_1 + 8\Omega$ $R_{eq} = 12\Omega$	**1** **1** **1**	**3**
38.	(a) Ammeter reading becomes $\frac{X}{2}$ / halved (b) Ammeter reading becomes 2X / doubled (c) • Resistivity is equal to electrical resistance of a conductor of unit length and unit area of cross section. • SI unit= Ω m / ohm metre • Resistivity of an alloy is higher than its constituent metals. **OR** (c) (i) It has high melting point. (ii) The resistivity of an alloy is generally higher than that of its constituent metals. / Alloys do not oxidise (burn) readily at high temperatures.	**1** **1** **1** **½** **½** **1** **1**	**4**
39.	**(A)** (i)  Characteristics: • The magnet field lines emerge from north pole and merge at south pole. Inside the magnet, the direction of field lines is from its south pole to its north pole. Thus, the magnetic field lines are closed curves. • The relative strength of the magnetic field is shown by the degree of closeness of the field lines.	**1**	

	• No two field-lines are found to cross each other. (any two)	**(1+1)**	
	(ii) Imagine that you are holding a current carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of field lines of the magnetic field.	**1**	
	(iii) As the concentric circles become larger and larger, the magnetic field decreases.	**1**	
	OR		
	(B)		
	(i) 	**1**	
	Salient features: • The pattern of the magnetic field lines in a solenoid is similar to that of a bar magnet. • Field lines inside the solenoid are in the form of parallel straight lines.	**1** **1**	
	(ii) • A magnetic material which behaves like a magnet on passing electric current through it is called an electromagnet. • It is made by wrapping a current carrying insulated copper wire in the form of a coil around a magnetic material like soft iron / By placing a magnetic material like soft iron as a core material inside the current carrying solenoid.	**1** **1**	**5**