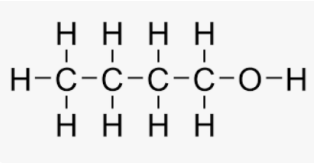
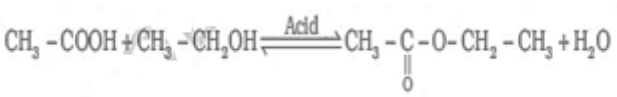
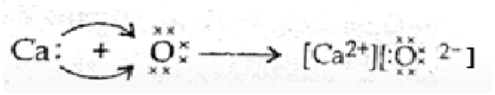
MARKING SCHEME
SCIENCE (Subject Code-086)
(PAPER CODE: 31/5/2) (10-05-86K)

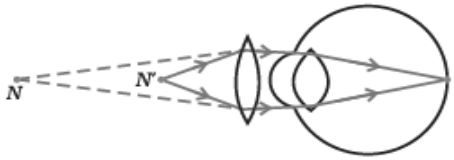
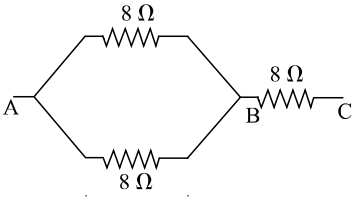
Q.No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total marks
	SECTION – A **Biology**		
1.	(C)/ Uterus	**1**	**1**
2.	(D)/ Budding	**1**	**1**
3.	(C)/ Guard cells	**1**	**1**
4.	(D)/Glucose → pyruvate $\xrightarrow{\text{lack of oxygen}}$ Lactic acid + Energy	**1**	**1**
5.	(B)/ DDT	**1**	**1**
6.	(C)/ 44 + XY	**1**	**1**
7.	(C)/ 1, 2, 3 and 4	**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.	(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**
11.	• 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 → • Right atrium pushes it to right ventricle, to be sent to lungs for oxygenation.	½ ½ ½ ½	**2**
12.	(i) • P – Chloroplasts • Absorb light energy and helps in photosynthesis. (ii) $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \underset{\text{(glucose)}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$	 ½ ½ **1**	**2**
13.	(a) • Plastics being non - biodegradable persist in environment for a long time. (any other harmful effect) • Alternative - Jute or cloth bag	 ½ ½	

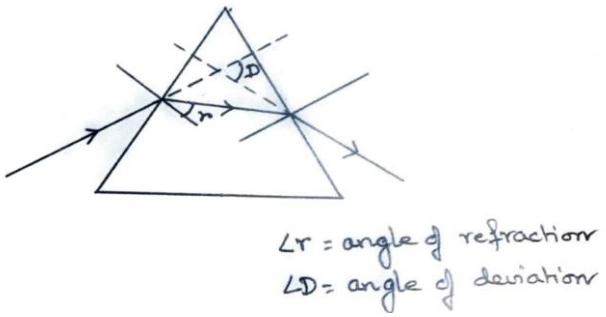
	(any other suitable alternative) (b) • Pesticides and chemical fertilizers are not biodegradable. They accumulate progressively at each trophic level. As human beings occupy the top level in any food chain the maximum concentration of these chemicals get accumulated in our bodies. • This Phenomenon is biological magnification.	**1** **1**	**3**
14.	(a) • Adrenal gland • Adrenaline (b) Responses • Adrenaline acts on the heart and makes the heart beats faster to provide oxygen to the muscles. • The blood supply to skin and digestive system is reduced due to contraction of muscles of arteries to divert the blood through skeletal muscles. • Breathing rate increases due to contraction of diaphragm and rib muscles. (any two responses)	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 into the blood from the initial filtrate 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. **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.	½ ½ **1** **1** **1** **1** **1**	**4**

16.	**(A)** (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, any other advantage) (iii) Roses, grapes, banana, orange, jasmine etc. (any other two examples) (iv) Regeneration is carried out by specialised cells. The organisms which have those cells only can show regeneration. **OR** **(B)** (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.	**1** **(1+1)** **½ + ½** **1** **1** **1** **1** **1** **1**	**5**
	SECTION – B **Chemistry**		
17.	(D)/ C_4H_8 and C_5H_{12}	**1**	**1**
18.	(D)/ Al_2O_3	**1**	**1**
19.	(C)/ The amount of H_2 gas evolved in less amount.	**1**	**1**
20.	(B)/ 2: 1	**1**	**1**
21.	(D)/ CH_3COONa | CH_3COOH | NaOH | Basic	**1**	**1**
22.	(C)/ C_3H_8	**1**	**1**
23.	(D)/ magnesium and aluminium	**1**	**1**
24.	(A)/ Both A and R are true, and R is the correct explanation of A.	**1**	**1**
25.	• Universal indicator is obtained by mixing several indicators. • Universal indicator shows different colours at different concentrations of hydrogen ions in a solution.	**1** **1**	**2**
26.	(i) Calcium carbonate decomposes to calcium oxide and carbon dioxide.	**½**	

	$CaCO_3(s) \xrightarrow{Heat} CaO\ (s) + CO_2(g)$ (ii) Silver bromide decomposes to silver and bromine by light. $2AgBr\ (s) \xrightarrow{Sunlight} 2Ag\ (s) + Br_2(g)$ (iii) Lead displaces copper from copper chloride solution. $Pb\ (s) + CuCl_2(aq) \rightarrow PbCl_2(aq) + Cu(s)$ (Note: Award full marks if balanced chemical equation is written)	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. (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) • $CH_3 - CH_2 - CH_2 - CH_2OH$ /  • Butanol (b) • Ethanol gets oxidised to form ethanoic acid. • $CH_3 - CH_2 - OH \xrightarrow{\text{alkaline } KMnO_4 + heat} CH_3COOH$ (c) •  • Esterification reaction. **OR**	½ ½ ½ ½ 1 1	

	(c) • Ethanol will get dehydrated to form ethene. ½ $CH_3CH_2OH \xrightarrow{\text{Conc.}H_2SO_4 \text{ at } 443K} CH_2 = CH_2 + H_2O$ ½ • Dehydrating agent / Catalyst 1		4
29.	(A) (i) (I) A considerable amount of energy is required to break strong inter-ionic attraction. 1 (II) Solder has low melting point. 1 (III) Because Na or Mg have more affinity for oxygen than carbon. 1 (ii) (I) Fe_2O_3/ Iron (III) oxide ½ (II) Thermit reaction ½ (III) $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s) + Heat$ 1 (Deduct ½ mark if no/ incorrect balancing) **OR** (B) (i) (I) $2Cu_2O + Cu_2S \rightarrow 6Cu(s) + SO_2(g)$ 1 (II) $2ZnS(s) + 3O_2(g) \rightarrow 2ZnO(s) + 2SO_2(g)$ 1 (Deduct ½ mark if no/ incorrect balancing in each case) (ii) (I) PVC provides insulation on the current carrying wires 1 (II) Copper does not react with cold water, hot water and steam. / Copper is a better conductor than steel. 1 (iii)  1		5
	SECTION – C **Physics**		
30.	(A)/Converging lens.	**1**	**1**
31.	(A)/20cm	**1**	**1**
32.	(D)/Assertion (A) is false but Reason (R) is true.	**1**	**1**
33.	(a) Absolute refractive index of a medium is the ratio of speed of light in air to the speed of light in the given medium / Refractive index of a medium with respect to air / $n = \frac{c}{v}$ 1 (b) $V_D < V_A < V_B < V_C$ 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. 1 (ii) From 25cm (near point) to infinity (far point) 1 **OR** (B)		

	 (Deduct ½ mark for not showing the direction of light)	**2**	**2**
35.	(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**
36.	• $u = -30$ cm, $f = 15$ cm $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{15} + \frac{1}{-30}$ $v = 30$ cm • $m = \frac{v}{u} = +\frac{30}{-30} = -1$ Hence, size of image will be same as the object. / Size of image will be same as size of object because when object is kept at $2F_1$, image will be formed at $2F_2$.	½ ½ **1** **1**	**3**

37.	(a)  ∠r = angle of refraction ∠D = angle of deviation Diagram Labelling (b) • Angle of deviation will not change. • The ray of light will retrace its original path.	1 ½+½ ½ ½	**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) Features • Direction of current changes periodically/ alternating current. • Frequency of current supplied in our houses is 50 Hz. (ii) **Direct current**: (I) Flows in one direction; (II) Sources : Cell / battery **Alternating current**: (I) Reverses its direction periodically.; (II) Source : Power-plant (any other suitable difference)	**1** **1** **1** **1**	

(iii) Live wire has red insulation cover and neutral wire has black insulation cover. **1**

OR

(B) (i) Because it is a safety device, which prevents the damage to electric appliances and circuit caused due to overloading. **1**

(ii)

Over loading	Short circuiting
It is caused when too many appliances are connected to a single socket./ Due to accidental hike in the supply voltage.	It is caused due to direct contact of live wire with the neutral wire.

2

(iii)

- A piece of wire made of a metal or an alloy. **1**
- appropriate (low) melting point. **1**

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