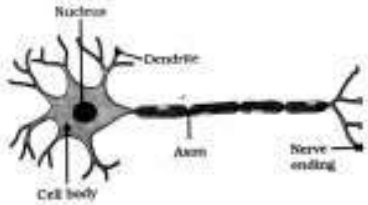
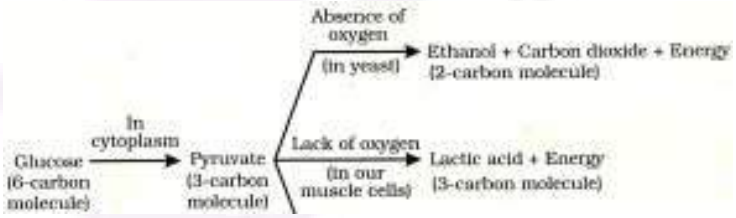
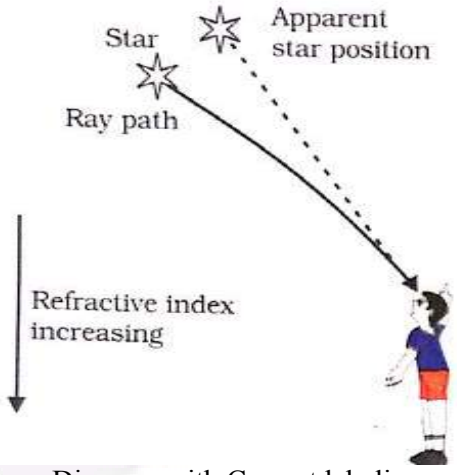
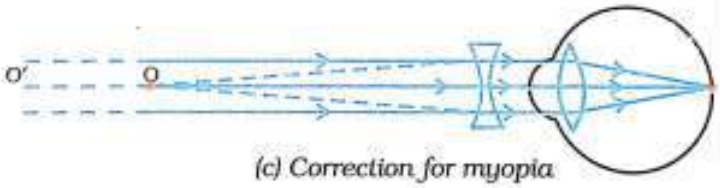
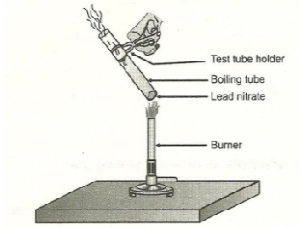
MARKING SCHEME–SCIENCE (Code No.31/3/1) SET-I

Q.N	Key Points	Marks	Grand Marks
1	Resistance of material / conductor whose area of cross section is $1m^2$ and length 1 meter.	1	1
2	The two main components of an ecosystem are a) Biotic b) Abiotic	½ + ½	1
3	• The compound formed by the combination of ions/ formed by transfer of electrons. • Movement of ions in the solid is not possible due to the rigid structure / strong electrostatic attraction/ no free ions.	1 1	2
4	When tendril comes in contact with any support • Auxin diffuses towards the part away from the contact. • The part in contact with support does not grow as rapidly as the part of tendril away from the support causing the tendril to coil around the support. **OR** Nerve impulse – an electrical signal transmitted along a nerve fibre. This impulse travels from the **dendrite** to the **cell body** and then along the **axon** to its end. (can be explained by labeled diagram) 	2 ½ 1 ½	2
5	When sunlight passes through the atmosphere, the fine particles in the air scatter the blue colour (short wavelength) more strongly than red. The scattered blue colour enters our eyes.	2	2
6	• The concentration of H^+ ions determines the nature of solutions whether it is acidic or basic. • Yes, basic solution have H^+ ions • The concentration of OH^- ions is more than H^+ ions in basic solution.	1 ½ 1½	3
7	<table><tr><th>Activity</th><th>Observation</th><th>Inference</th></tr><tr><td>Put metal R in the sulphate solution of metal Q and P</td><td>Solution becomes colourless in both the test tubes.</td><td>R displaces P and Q ions from their solutions.</td></tr><tr><td>Put metal P in the solution of sulphate ions of metal Q</td><td>No reaction</td><td>P cannot displace Q ions from the solution</td></tr></table>So the P < Q < R	1 1	

	(From activity to inference award 1 mark) OR Cinnabar / (HgS) $2HgS + 3O_2 \rightarrow 2HgO + 2SO_2$ $2HgO \xrightarrow{\Delta} 2Hg(l) + O_2$ (Complete process explained in the form of sentence full credit may be given.)	1 1 1 1	3
8	Atomic number 13(2, 8, 3) element has electropositive character, belongs to group 13 and has valency 3.	1+1+1	3
9	Four function of human heart: • Receives deoxygenated blood from body • Sends blood to lungs for oxygenation • Receives oxygenated blood from lungs • Pumps oxygenated blood to different parts of body (or complete functioning of heart with correct description) • To have efficient supply of O_2 for their high energy needs. Separation of oxygenated and deoxygenated blood.	½ x 4 ½ + ½	3
10	The first step in the breakdown of glucose. Glucose is converted to pyruvate. - Pyruvate in the absence of O_2 may be converted to ethanol, CO_2 and energy - Pyruvate in the shortage of O_2 may be converted to lactic acid and energy. OR  	1 1 1	3
11	<table><tr><th>Cerebrum</th><th>Cerebellum</th></tr><tr><td>1) It is a part of fore brain</td><td>1) It is a part of hind brain</td></tr><tr><td>2) It initiates intelligence, memory, voluntary movements etc.,</td><td>2) It maintains posture and equilibrium</td></tr><tr><td>3) Main thinking part of the brain.</td><td>3) Controls voluntary actions like walking in a straight line, picking up a pencil, riding a bicycle etc.</td></tr></table>	½ + ½ ½ + ½ ½ + ½	3
12.	a) Speciation: It refers to the process by which new species are	1	

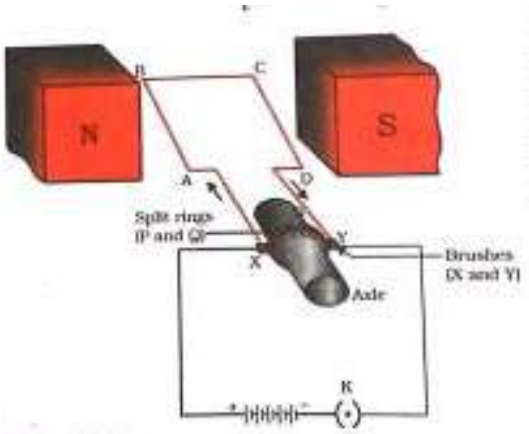
	formed from the pre-existing species i) Geographical isolation ii) Genetic drift iii) Natural selection (b) Natural selection is the process by which organisms having some special features are at an advantage for better survival in the changed environment. (Or explanation with the help of the any example) **OR** • F_1 generation – all plants with round seeds • F2 generation – plants with round and wrinkled seeds. • Tall / dwarf plants Yellow / green seeds White / purple flowers (any two)	½ 1½ 1 ½ + ½ ½ + ½	3
13	• Bending of light due to the variation in optical density of the medium. • The starlight, on entering into earth's atmosphere undergoes continuous refraction before it reaches the earth. • The since the atmosphere bends starlight towards the normal, the apparent position to the star is slightly different from its actual position.  Diagram with Correct labeling OR (i) If the student cannot see the words written on the black board then he is considered myopic. (ii) The defect may arise due to 1) Excessive curvature of the eyeball 2) Elongation of the eyeball (iii)	½ ½ ½ 1½ 1 ½ x 2	

	 (c) Correction for myopia	1	3
14	(i) • Biogas • Wind energy • Solar energy } Any two • Tidal wave • Geothermal (ii) • Because these are renewable sources of clean energy. • All of these energy sources are pollution free • Do not release any harmful substance. • Do not cause pollution (or any other)	½ + ½ ½ + ½ ½ + ½	3
15	Forests are rich reservoir of biodiversity containing a large number of plants and animals. Approaches towards conservation of forests: a) Help of local people should be taken / local people should be involved b) Indiscriminate destruction of forest should be strictly prohibited. c) Planting of trees should be increased. d) Destruction of forests should not be done for making, roads, dams and hotels etc.	1 ½ x 4	3
16	(a) Exchange of ions in a reaction between two. (b) $Na_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2\ NaCl$ (If the answer is in descriptive form award marks) (b) (i) Combination reaction: A combination reaction is a reaction where two or more elements or compounds combine to form a single compound. (ii) $CaO + H_2O \rightarrow Ca(OH)_2$ Quick lime Calcium Hydroxide	1 1 ½ + ½ ½	

	Chemical name of the product formed - (Calcium hydroxide (slaked lime) (iii) Observations of the reactions: - Reaction takes place vigorously - Large amount of heat is released. OR (a) Activity : Take a pinch of lead nitrate powder in a test tube. Heat it over the flame.  (½ marks for labeling) (b) Observation : • Emission of brown fumes observed • Reddish brown colour of residue (any one) (c) $2Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s) + 4NO_2(g) + O_2(g)$ Lead nitrate → Lead oxide, Nitrogen dioxide, Oxygen	½ ½ + ½ 1 1 ½ + ½ 1+1	5 5
17	Esterification $CH_3COOH + CH_3CH_2OH \xrightarrow{Acid} CH_3COOC_2H_5 + H_2O$ Ethanoic Acid Ethanol → Ethyl ethanoate Saponification $CH_3COOC_2H_5 \xrightarrow{NaOH} C_2H_5OH + CH_3COONa$ Ethyl ethanoate → Ethanol, Sodium Acetate b) • Take 1 ml of ethanol and 1ml of glacial acetic along with a few drops of concentrated sulphuric acid in a test tube. • Warm in a water bath for at least 5 minutes. • Pour into a beaker containing 20-20 ml of water and fruity smell the remelting mixture. • Ester is formed.	1½ 1½ ½ x 4	5
18	a) **Reproduction-** The process of producing offsprings / young ones of its own kind. Types: i) Asexual ii) Sexual **b)**	1 1 1	

	Unicellular Organisms / **Multicellular Organisms** 1) Only one parent is required / Two parents are required 2) It is a fast process of reproduction. / Slower process of reproduction than in unicellular organisms. 3) No specialized cells are required for reproduction. / Specialized cells are required for reproduction. **(Any two points)** **OR** a) STD- A disease that can be transmitted through sexual contact. • Viral – i)Warts ii) AIDS • Bacterial- i) Gonorrhoea ii) Syphilis b) Contraception: The method of preventing unwanted pregnencies, Reasons – i) To prevent unwanted pregnancies ii)To control population rise / birth rate iii)To prevent transfer of STD's iv)Proper gap between successive births v)For the better health of mother (Any three)	1 1 1 ½ + ½ ½ + ½ ½ ½ x3	5
19	(a) Characteristics: i) The image is same size as the object. ii) The image is erect and virtual. iii) The image is laterally inverted. iv) The distance between the object and mirror is same as the distance between image and mirror. (b) h = 5cm u = – 20cm f = – 30 $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{-30} + \frac{1}{-20}$ v = –60cm $\frac{h'}{h} = \frac{v}{u}$ *h' = 15cm* *Size - enlarged*	½x4 ½ 1 ½ ½ ½	5

20	(a) • In series - $R_S=R_1+R_2+R_3$. • In parallel - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}$ Resistance is at minimum - $\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}$ $\frac{1}{12}+\frac{1}{12}=\frac{2}{12}=6\Omega$ Resistance is maximum - $R_S=R_1+R_2$ $R_s=12+12=24\ \Omega$ $P=\frac{v^2}{R}$ Power ration in parallel and series = 4:1 (b) $\frac{P_{min}}{P_{max}}=\frac{V^2/R_{min}}{V^2/R_{max}}=\frac{R_{max}}{R_{min}}=\frac{24}{6}=\frac{4}{1}$ OR (a) $R\alpha l$ $R\alpha\frac{1}{A}$ $R\alpha\frac{l}{A}$ $R=\rho\frac{l}{A}$ $\rho=\frac{RA}{l}=\frac{ohm\times m^2}{m}$ $=ohm\times m$ (b) $\rho=\frac{RA}{l}$ $=\frac{100\times3\times10^{-7}}{5}$ $=60\times10^{-7}\ ohm\times m$	½ ½ 1 1 2 ½ x 6 ½ ½ 1	5
21	(a)		

	• The rule is Fleming's left hand rule. • If the finger points in the direction of the magnetic field and the second finger in the direction of the magnetic field and the second finger in the direction of current then the thumb will point in the direction of motion or the force acting on the conductor (b) Electric motor.  	1 2 2	5
22	• Putting Cu strips in $FeSO_4$ --- no reaction • Putting Al strips in $FeSO_4$ -- change in colour observed • Displacement reaction • $Al+FeSO_4 \rightarrow Al_2(SO_4)_3+Fe$ (OR) 1) Do not point the mouth of boiling tube at your neighbours or yourself / point the test tube away from the body 2) Hold the test tube in inclined position 3) Hold the test tube with Tongs (Any two)	½ ½ ½ ½ 1+1	2
23	Ethanoic acid a) Odour – it smells like vinegar b) It is soluble in water c) Blue litmus to red d) $NaHCO_3 + CH_3COOH \rightarrow CH_3COONa + H_2O + CO_2$	 ½ ½ ½ ½	2
24	i) Conical flask is not air tight. ii) Freshly prepared solution of KOH not used. iii) Germinating seeds may be dry. (any two)	 1+1	2
25	a) Saffranin is used to stain the material for better view. b) Glycerine is used to avoid drying of peel. OR i) Take a thin peel of leaf on a glass slide.	1 1 ½	

	ii) Stain it with saffranin iii) Remove extra stain iv) Put a drop of glycerin and cover it with cover slip	½ ½ ½	2
26	i) Fix a concave mirror on a stand and place it near a source of bright light ii) Place a screen fitted on a stand in front of the mirror iii) Move the screen back and forth, until a sharp and clear image of a distance object line a tree is obtained on the screen iv) Mark the position of mirror and screen on the scale and note the distance between them OR The student should take the following precaution (a) Precaution - (i)See that the pins are in a straight line and atleast 3cm apart. (ii)Angle of incidence should be between 30^0 to 60^0. (iii) Glass slab should always remain inside the boundary. (any two) (b) Conclusion - (i) The emergent ray is parallel to incident ray (ii) Lateral displacement takes place. (iii) Angle of incidence = Angle of emergence (any two)	½x4 ½ ½ ½ ½	2
27	a) 0.15V is the least count b) The reading shown is 1.8V $c)$ $R = 20\Omega$ V=1.8V I=$\frac{V}{R} = \frac{1.8}{20} = .09amp$	½ ½ 1	2