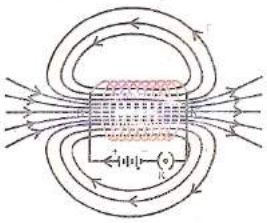
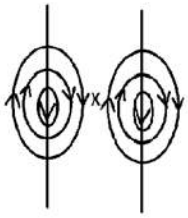
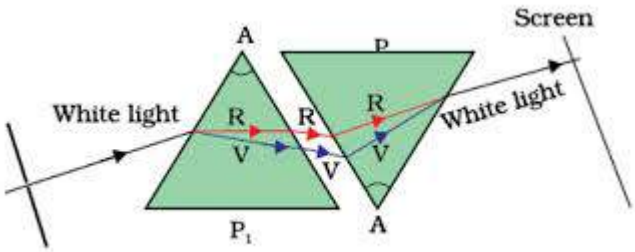
CBSE Class 10 Science Solution PDF

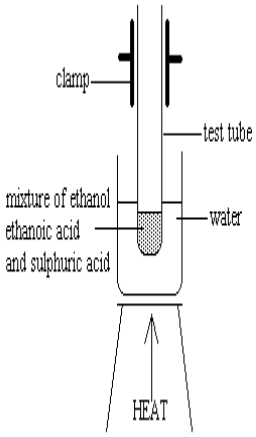
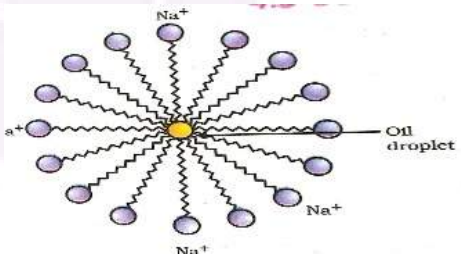
SET 31 / 4 / 2

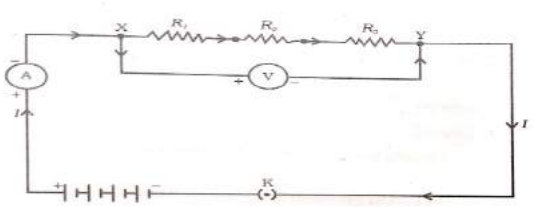
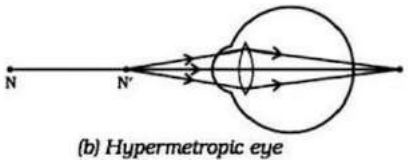
Q. No.	Value Point / Expected Answer	Value	Total Marks
1	The rate of flow of charges through a conductor is called electric current. Its S.I. unit is ampere (A)	½ ½	1
2	Infrared (attempted answers will be awarded full marks)	1	1
3	**First law** :The incident ray ,the refracted ray and the normal to the interface of two mediums at the point of incidence, all lie in the same plane. **Second law :**The ratio of sine of angle of incidence to sine of angle of refraction is always constant for a given pair of medium .This constant is called refractive index. OR (i)Erect (ii) virtual (iii) magnified (iv) Behind the mirror	1 1 ½ x 4	2
4	Field pattern Polarity Direction of field 	1 ½ ½	2
5	Compounds name –ethanol molecular formula-C_2H_5OH Reaction: C_2H_5OH + conc. $H_2SO_4 \rightarrow CH_2= CH_2 + H_2O$	½ ½ ½ + ½	2
6	• Gradual change that takes place over millions of years occurring in living organisms. • Reason: More complex group of organisms are formed even though simpler forms continues to flourish and are equally efficient. Eg bacteria can survive. Eg: Bacteria.	1 1 1	3
7	(a) The plant will immediately change the shape by changing the amount of water in them (swelling or shrinking) thus bringing movement. (b) (i) Gibberellin/Auxin (ii) Cytokinin	1 1 1	3

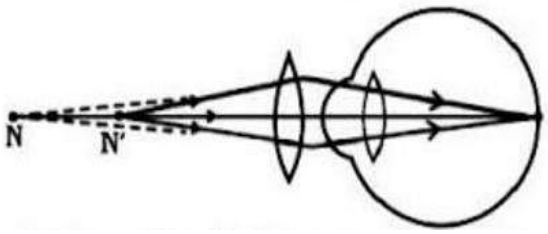
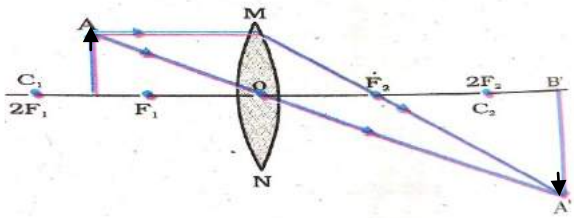
8	a) i)Saliva –contains salivary amylase, converts starch to sugar ii) HCl in stomach- medium acidic/kills pathogen (germs) iii) Bile-emulsifies fats/neutralizes acidic food in the duodenum iv) Villi -increases surface area for absorption b) i) Pepsin: digest protein . ii)Lipase: digest fats	½ x4 ½ ½	3
9	P- sodium bicarbonate, $NaHCO_3$ Q-sodium carbonate, Na_2CO_3 R- carbon dioxide, CO_2 Reaction: $2NaHCO_3 \rightarrow Na_2CO_3 + CO_2 + H_2O$ $CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$	½ ½ ½ 1 ½	3
10	a) i) double displacement reaction ii) combination reaction iii) decomposition reaction iv) displacement reaction b) $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 2AlCl_3 + 3BaSO_4$ **OR** a) Yellow, lead iodide b) $2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$ c) Double displacement, precipitation reaction	½ x 4 1 ½+½ 1 ½ x 2	3
11.	• The Metals high up in reactivity series are very reactive, because of difference in their reactivity. • Methods of extraction of metals depends on their reactivity. • Electrolytic reduction followed by electrolytic refining.	1 1 1	3
12.	 Magnetic field will be nullified. B will be zero at X. Since, direction of Magnetic Field lines due to both wires opposite to each other.	½ ½ ½ ½ 1	3
13	• Cause of dispersion: (i) Shape of prism (ii) Different colours bend with different angles (different colour has different refractive index or different speed) diagram Arrow& labelling	1 1 1	

	 OR Scattering of light means to throw light in all possible direction when light intract with particles of medium. **(i)The Sun appears reddish at sun-rise** : the Sun rays have to travel through a large atmospheric distance near the horizon .As the wave length of red light is maximum in the visible range , hence the scattering is least . The blue light and shorter wavelengths are scattered away by the particles .This gives rise to the reddish appearance of the sun./diagrammatic answers may be given fig:11.12 **(ii)The sky appears blue**: Blue colour has shorted wavelength than red. When sunlight passes through the atmosphere, the fine particles in the air scatter the blue light more strongly than red. Hence the clear sky spears blue.	1 1 1	3
14	(a) Manmade ecosystem | Natural ecosystem no microbes to clean the water | microbes to clean the water (b) The micro-organisms that breakdown the complex organic substances into simple inorganic substances. • No decomposition would take place. • Soil would be unsuitable for crops/it would result in imbalance in Ecosystem • nutrients would not returned back to the nutrient pool • Land pollution/affect soil fertility or any other. OR • The higher energy UV radiations split apart some molecular oxygen into free oxygen atoms . These atoms then combine with molecular oxygen to form ozone.. $O_2 \xrightarrow{UV} O+O$ $O_2 + O \longrightarrow O_3$ • It prevents harmful UV radiation to reach the earth. • CFC/chlorofluoro carbon/aerosol • Skin cancer/reduction in immune system/cataract/damages eyes.	1 1 1 1 ½ ½ ½ ½	3
15	Excessive use of natural resources, so that immediate benefits are available for present generation. **Advantages** • Industrial growth will be fast • Rapid development will take place • Resource are utilized to their maximum • Growth in economy / employment (any other relevant advantage).	1 ½ x4	3
16	a) (i) Tall plants (ii) Tall: dwarf = 3:1 (iii)Dwarf plants. Tall is dominant and dwarf is recessive. Segregation of genes	½ ½ ½ ½ + ½ ½	

	(b) • The structures which have the same structural plans / origin but different functions.eg: forelimb of human and wings of a bird • Yes	1½ ½	5
17	a) Reproduction through vegetative parts of a plant like Roots / stem / leaves/Artificial / Layering / Grafting (any two) b) (i) In some plants which produce non viable seeds. (ii) It consumes less time / fast method c) Budding in hydra: Diagram Labelling (if student writes explanation award marks) OR • Prevention of unwanted pregnancy. • Method : (i) mechanical barrier – condom (ii) surgical method – tubectomy / vasectomy (iii) chemical – Oral and vaginal pills (iv) IUCD – copper -T • Reasons: (i) Gap between children (ii) mother's health (iii) better living standard (iv) population under control or any other relevant points.	1 ½ x2 2 1 1 ½ x 4 ½ x4	5
18	(a) (i) This law was applicable only upto calcium ii) Could not explain the position of hydrogen atom. (b) Atomic no of A / Ca-20. Electronic configuration 2.8.8.2 ; atomic no B / Cl- 17.Electronic configuration 2.8.7 $CaCl_2$ / AB_2 Acidic salt It is a salt formed between strong acid and a week base	1 1 ½ + ½ ½ ½ 1	5

19	(a) $C_2H_5OH + CH_3COOH \rightarrow CH_3COO\ C_2H_5 + H_2O$(esterification) Alcohol Acid Ester Water $CH_3COOC_2H_5 + NaOH \quad C_2H_5OH + CH_3COONa$ (saponification) Ester Base Alcohol Salt b) Diagram for esterification  Description 1mL ethanol, 1mL glacial acetic acid and a few drops of conc. H_2SO_4 ↓ Warmed in a water bath ↓ Water is poured into the beaker ↓ Fruity smell is produced **OR** • Soaps are sodium salts of fatty acids. • Detergents are sodium salts of sulphonic acids. Soaps do not act in hard water due to formation of scum while detergents do. • Cleansing action of soaps: In soaps carbon chain dissolves in oil and the ionic end dissolves in water to form micelle  • Hard water contains Ca^{2+} / Mg^{2+} ions that react with soap and form precipitates called scum. • By using detergents in hard water / boiling hard water	½ ½ 1+1 ½ x 4 1½ 2 1 ½	5

20	(a) It is the rate at which electrical energy is dissipated or consumed in an electrical circuit is called electric power . We know V=W/Q W=VQ W/t = VQ/t P = VI P = IR.I $P = I^2R$ (b) Bulb I: I=P/V,100W 220V I_1 =100/220A =5/11A Bulb II :60W 220V I_2 = 60/220A = 3/11 A Total current (5/11 +3/11)A =8/11A=0.72A OR (a) • Three resistors R_1, R_2, R_3 are joined. • They are connected with the battery and ammeter and a plug key. • The ammeter reading is noted. • Position of ammeter is changed to different position and readings taken each time. • The reading remain same. (If it is explained by diagram, give full credit) (b)  (i) $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$ $\frac{1}{R_1} = \frac{1}{R_1} + \frac{1}{R_1}$ $R_t = R_P + 12\,\Omega$ $R_t = 24\,\Omega$ V= IR_T I = 6/24=0.25 Ampere (ii) Same readings of A_1 and A_2	1 2 2 2½ 1½ 1	5
21	(a) Hypermetropia / farsightedness Causes: i. Shortening of eyeball ii. Curvature of eye lens decreases / focal length of eye lens increases. b)  (b) Hypermetropic eye	½ ½ ½ 1	

	(c) Convex lens 1/f=1/v-1/u =1/(-50cm) -1/(-25cm) =1/50cm Hence ,f=50 cm=0.5m There fore power =(1/0.5)D=2D (d)Correction of Hypermetropia  	½ ½+ ½ ½ ½	5
22	• Set up A is correct. • Ammeter should be connected in series whereas voltmeter should be connected in parallel to the resistor across which potential difference is to be measured. • Positive of voltmeter and ammeter should be connected to the positive of supply voltage.	½ ½ + ½ ½	2
23	Mistakes :F_1 and F_2 are not equidistant from the optical center of the lens. $OF_1 \neq OF_2$; $2OF_1 \neq 2OF_2$ Image should form beyond $2F_2$ Image should be magnified (any two)  OR (i) Prism should be within the boundary all through the experiment . (ii) Pins should be fixed vertically and the feet of the pins should be observed. (iii) Protractor should be used correctly . (iv) Angle shouldbe taken between 30^o and $60^o$to observe the refraction clearly. (v) Separation between the pins should be kept at least 5cm . (any four)	½ x2 1 ½ x4	2
24	• Nucleus elongates • Constriction in cytoplasm / cell membrane	1 1	2

25	• Taking out the leaf peel and mount on the slide_ • stain with safranin • mount with glycerin • place cover slip and observe under microscope. OR i)To prevent the entry of oxygen/escape of CO_2 / air ii)KOHabsorb CO_2 gas iii)KOH absorb CO_2 gas/Partial vacuum created	½ x4 1 ½ ½	2
26	• No Change • In solid form (powder no reaction will take place because H^+/H_3O^+ (ions) are not available. $Na_2SO_4 + BaCl_2 \rightarrow NaCl + BaSO_4$(white ppt) **OR** Cu<Fe< Zn<Al i) Deposition of brown colour on iron. ii) Blue Colour change is to green.	1 ½ + ½ 1 ½ ½	2
27	(i) X- acidic, pH of X is < 7 (ii) Y- basic, pH of Y is >7	1 1	2