## CBSE Class 10 Science Solution PDF

## **SET 31/4/3**

Q. No.	Value Point / Expected Answer	Value	Total Marks
1	Potential difference between ends of conducter	1	1
2	(i) Uses renewable sources of energy.		
	(ii) Maintenance cost is very less.		
	(iii) Long life.	$\frac{1}{2} + \frac{1}{2}$	1
	(any two)		
3	(i)Erect (ii) virtual (iii) magnified (iv) same side of the object OR	½ x 4	
	<ul> <li>Refractive index is the ratio of speed of light in air or vacuum to speed of light in medium.         Mathematically: Refractive index of a medium 1.5     </li> <li>Speed of light in medium = 2x10<sup>8</sup>ms<sup>-1</sup></li> <li>Speed of light in vacuum?</li> </ul>	1	
	$\mu = \text{speed of light in vacuum} / \text{speed of light in medium}$ $\text{speed of light in vacuum} = 1.5 \times 2 \times 10^8 \text{ ms}^{-1}$ $3 \times 10^8 \text{ ms}^{-1}$	5	2
4	Yes because alpha particles are positively charged and moving	LOY	
	charged particles produce magnetic field.	$\frac{1}{2} \times 2$	
	<ul> <li>No because neutron has no charge. No magnetic field produced.</li> </ul>	½ x2	2
5	Alk.KMnO <sub>4</sub> (5%) heated $CH_3CH_2OH + 2[O]  CH_3COOH + H_2O$ Ethanol Acidic $K_2Cr_2O_7$ Ethanoic Acid	1	
	Alk.KMnO <sub>4</sub> is working as a oxidizing agent so it oxidizes Ethanol to ethanoic acid	1	2
6	<ul> <li>Conserving the environment:         Preventing pollution/bring rainfall/ oxygen supply (or any other)     </li> </ul>	½ x3	
	<ul> <li>Depletion:         Deforestation / increase in population / scarcity of water (or any other)     </li> <li>Consequences:</li> </ul>	1/2	
	Reduction in rainfall / reduction in the yields of forest products / imbalance in eco system	½ x 2	3
7	(a)	1	
	Manmade ecosystem Natural ecosystem		
	no microbes to clean the water  microbes to clean the water	1	
	(b) The micro-organisms that breakdown the complex organic	1	
	substances into simple inorganic substances.	1	
	No decomposition would take place.		
	Soil would be unsuitable for crops/it would result in imbalance in Ecosystem     putrients would not returned book to the putrient real.		
	<ul> <li>nutrients would not returned back to the nutrient pool</li> <li>Land pollution/affect soil fertility or any other.</li> </ul>		
	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		
	$O_2$ $O_2+O$ $O_3$ $O_3$	1 ½	
	$O_2 + O \longrightarrow O_3$	1/2	
	• It prevents harmful UV radiation to reach the earth.	1/2	3
	CFC/chlorofluoro carbon/aerosol	1/2	
0	Skin cancer/reduction in immune system/cataract/damages eyes.	4	
8	• Right hand thumb rule: If we hold a current carrying straight	1	
	conductor in our right hand, such that the thumb gives the		
	direction of electric current then the curled fingers give the	1	
	direction of the magnetic field.		
	• The magnetic field will be directed perpendicular into the plane of	1	
	table inside the circular loop.		
	• The magnetic field will be directed perpendicular outside plane of		
	table for a point outside the circular loop. / Diagram:		
	(diagram is not necessary)		3
9	Cause of dispersion:	1	
	i) Shape of prism		
	ii) Different colours bend with different angles (different colour has different		
16	efractive index or different speed) diagram	.034	
	ulagiaili	1	
	Arrow& labelling		
		3	
	White light R R White light P <sub>1</sub> A	1	
	OR		
	cattering of light means to throw light in all possible direction when light intract with particles of medium.	1	
m sl re	(i)The Sun appears reddish at sun-rise: the Sun rays have to travel through large atmospheric distance near the horizon. As the wave length of red light is naximum in the visible range, hence the scattering is least. The blue light and horter wavelengths are scattered away by the particles. This gives rise to the eddish 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 he blue light more strongly than red. Hence the clear sky spears blue.	1	3
4.0		1	
10	• $X=Al$ , $Y=Al_2O_3$	$\frac{1}{2} + \frac{1}{2}$	
l			

			2
	• $Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$	1	3
11	<ul> <li>a) Plaster of Paris CaSO<sub>4</sub>.½H<sub>2</sub>O(Calcium sulphate hemihydrate)</li> <li>b) Heating calcium sulphate dihydrate, or gypsum, to373° K. CaSO<sub>4</sub>.2H<sub>2</sub>O → CaSO<sub>4</sub>.½H<sub>2</sub>O+1½H<sub>2</sub>O</li> <li>(c) on addition of water it sets into hard mass. CaSO<sub>4</sub>½H<sub>2</sub>O + 1½H<sub>2</sub>O → CaSO<sub>4</sub>. 2 H<sub>2</sub>O d) Making sculptures/statues / Decorative items/POP walls</li> </ul>	½ ½ ½ 1	3
12	a) i) double displacement reaction ii) combination reaction iii) decomposition reaction iv) displacement reaction b) 3BaCl <sub>2</sub> + Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> →2AlCl <sub>3</sub> + 3BaSO <sub>4</sub> OR a) Yellow, lead iodide	½ x 4 1	
	b) 2KI +Pb(NO <sub>3</sub> ) <sub>2</sub> PbI <sub>2</sub> + 2KNO <sub>3</sub> c) Double displacement, precipitation reaction	½+½ 1 ½ x 2	3
13	Diagram of the Human Excretory System  Left renal artery  Left kidney  Left ureter  Vena cava  Urinary bladder  Urethra		
	Diagram  Labelling	1½ ½ x 3	3
14	<ul> <li>(a) The plant will immediately change the shape by changing the amount of water in them (swelling or shrinking) thus bringing movement.</li> <li>(b) (i) Gibberellin/Auxin</li> <li>(ii) Cytokinin</li> </ul>	1 1 1	3
15	<ul> <li>Fossils are dead remains or traces of preserved plants and animals buried under the earth's crust.</li> <li>Relative Dating:Digging the earth shows that the fossils closer to the earth surface are more recent than those in the deeper layers.</li> </ul>	1	

	• Carbon Dating: Detecting the rate element in the fossil material.	tios of different isotopes of the same	1	3
16	<ul> <li>a) Reproduction through vegetative leaves/Artificial / Layering / Grab)</li> </ul>		1	
	(i) In some plants which produce (ii) It consumes less time / fast n		½ x2	
	c) Budding in hydra:			
		Diagram	2	
		Labelling	1	
	(if student writes explanation award mar OR	ks)	0	
	<ul><li>Prevention of unwanted pregnan</li><li>Method :</li></ul>	ncy.	O'S.	
	(i) mechanical barrier – condor (ii) surgical method – tubectomy (iii) chemical – Oral and vaginal (iv) IUCD / copper -T • Reasons:	y / vasectomy	½ x 4	
	<ul><li>(i) Gap between children</li><li>(ii) mother's health</li><li>(iii) better living standard</li></ul>		½ x4	5
17	(iv) population under control  Acquired Traits	or any other relevant points.  Inherited Traits		
1,	1. These traits are not transferred from one generation to the next generation	1. These traits are transferred from one generation to the next		
	2. They do not bring about change in DNA	2. They bring about changes in DNA		
	3. They do not direct evolution	3. They do direct evolution.	1x2	
	( or ar	ny other relevant point and example)		
		imilarities since they have a common perform the different functions.	1	
	_	to identify the relationship between fferent organisms could be similar		

	because they have been inherited from a common ancestor.	1	5
18	(a) $C_2H_5OH + CH_3COOH \rightarrow CH_3COO C_2H_5 + H_2O(esterification)$	1/2	
	Alcohol Acid Ester Water  CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub> + NaOH C <sub>2</sub> H <sub>5</sub> OH+ CH <sub>3</sub> COONa (saponification)  Ester Base Alcohol Salt  b) Diagram for esterification	1/2	
	clamp—test tube  mixture of ethanol ethanoic acid and sulphuric acid	1+1	
	HEAT \		
	Description 1mL ethanol, 1mL glacial acetic acid and a few drops of conc. H <sub>2</sub> SO <sub>4</sub>	<i>-</i>	
	Warmed in a water bath	VOX.	
	Water is poured into the beaker	( Jan.	
	Fruity smell is produced	½ x 4	
	OR		
	<ul> <li>Soaps are sodium salts of fatty acids.</li> <li>Detergents are sodium salts of sulphonic acids. Soaps do not act in hard water due to formation of scum while detergents do.</li> <li>Cleansing action of soaps:         <ul> <li>In soaps carbon chain dissolves in oil and the ionic end dissolves in water to form micelle</li> </ul> </li> </ul>	1½	
	<ul> <li>Hard water contains Ca<sup>2+</sup> / Mg<sup>2+</sup> ions that react with soap and form precipitates called scum.</li> </ul>	2	
	By using detergents in hard water / boiling hard water		5
		1	

		1/2	
19	(a)		
	Increasing Atomic mass.	1/2	
	Similar properties in a group.	1/2	
	The physical and chemical properties of an element are periodic	1	
	function of their atomic mass.		
	No fixed position to Hydrogen because it resembles both alkali	1	
	metals / group 1, as well as halogen /group 17		
	(b) (i) Atomic size of elements decrease as we move from left to right	1	
	across a period as effective Nuclear charge increases		
		1	5
20	(ii) Increases down a group as number of shells increases.	1/	
20	(a) Hypermetropia / farsightedness Causes:	½ ½	
	i. Shortening of eyeball	1/2	
	ii. Curvature of eye lens decreases / focal length of eye lens increases.	~6	
	b)	D.K.	
	N N'	1	
	(b) Hypermetropic eye		
	(b) Tigpel had opti ege		
	(c) Convex lens	½ ½+ ½	
	1/f=1/v-1/u	/21 /2	
	=1/(-50cm) -1/(-25cm) =1/50cm		
	Hence ,f=50 cm=0.5m		
	There fore power =(1/0.5)D=2D	1/2	
	(d)Correction of Hypermetropia	1/	
	A (. )	1/2	
	· · · · · · · · · · · · · · · · · · ·		
	N N		
	v /		
	50 C C C C C C C C C C C C C C C C C C C		5
21	(a) It is the rate at which electrical energy is dissipated or consumed in an electrical circuit is called electric power.	1	
	We know		
	V=W/Q W=VQ	2	
	W=VQ W/t=VQ/t		
	P = VI		
	P = IR.I		

$P = I^2R$		
(b) Bulb I: I=P/V,100W 220V I <sub>1</sub> =100/220A =5/11A Bulb II:60W 220V I <sub>2</sub> = 60/220A = 3/11 A Total current (5/11 +3/11)A =8/11A=0.72A	2	
<ul> <li>OR</li> <li>(a)</li> <li>Three resistors R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> are joined.</li> <li>They are connected with the battery and ammeter and a plug key.</li> <li>The ammeter reading is noted.</li> <li>Position of ammeter is changed to different position and readings taken each time.</li> <li>The reading remain same.</li> </ul>	2½	
(If it is diagram, (b) explained by give full credit)	D POP	
(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 <sub>T</sub> I = 6/24=0.25 Ampere  (ii) Same readings of A <sub>1</sub> and A <sub>2</sub>	1½	5
Taking out the leaf peel and mount on the slide_ stain with safranin mount with glycerin place cover slip and observe under microscope.  OR	½ x4	3
i)To prevent the entry of oxygen/escape of CO <sub>2</sub> /air ii)KOHabsorb CO <sub>2</sub> gas iii)KOH absorb CO <sub>2</sub> gas/Partial vacuum created	1 ½ ½	2
<ul> <li>Nucleus elongates</li> <li>Constriction in cytoplasm / cell membrane</li> </ul>	1 1	2

24	No Change	1	
	• In solid form (powder no reaction will take place because H <sup>+</sup> /H <sub>3</sub> O <sup>+</sup> (ions)	1/2 + 1/2	
	are not available.		
	$Na_2 SO_4 + BaCl_2 \rightarrow NaCl + BaSO_4(white ppt)$		
	OR		
	Cu <fe< td="" zn<al<=""><td>1</td><td></td></fe<>	1	
	i) Deposition of brown colour on iron.	1/2	2
	ii) Blue Colour change is to green.	1/2	
25	(i) X- acidic, pH of X is < 7	1	_
	(ii) Y- basic, pH of Y is >7	1	2
26	Mistakes: $F_1$ and $F_2$ are not equidistant from the optical center of the lens.	½ x2	
	$OF_1 \neq OF_2$ ; $2OF_1 \neq 2OF_2$ Image should form beyond $2F_2$		
	Image should be magnified		
	(any two)		
	A M		
	C, F <sub>2</sub> 2F <sub>2</sub> B	1	
	2F <sub>1</sub> F <sub>1</sub> C <sub>2</sub>		
	N. V.		
	A'		
	OR	- KOY	
	(i) Prism should be within the boundary all through the experiment.	DAY.	
	(ii) Pins should be fixed vertically and the feet of the pins should be		
	observed.	9.	
	(iii) Protractor should be used correctly.		
	(iv) Angle shouldbe taken between 30° and 60° to observe the refraction		
	clearly. (v) Separation between the pins should be kept at least 5cm.	½ x4	2
	(v) Separation between the pins should be kept at least 5cm.  (any four)	/2 X <del>T</del>	2
27	Set up A is correct.	1/2	
	Ammeter should be connected in series whereas voltmeter should be	1/2 + 1/2	
	connected in parallel to the resistor across which potential difference is to		
	be measured.		
	<ul> <li>Positive of voltmeter and ammeter should be connected to the positive of</li> </ul>	1/2	
	supply voltage.		2