CBSE Class 10 Science Question Paper Solution 2020 Set 31/2/1
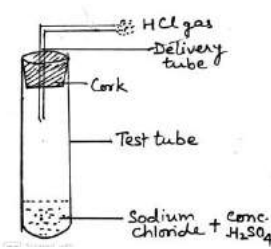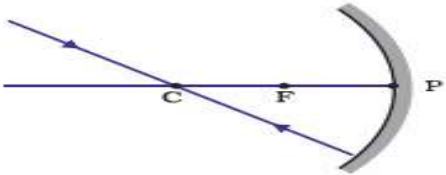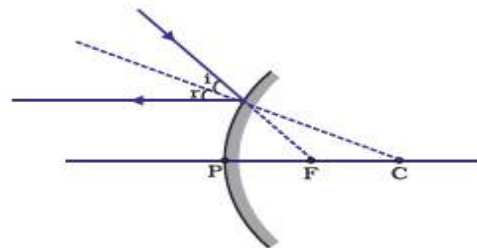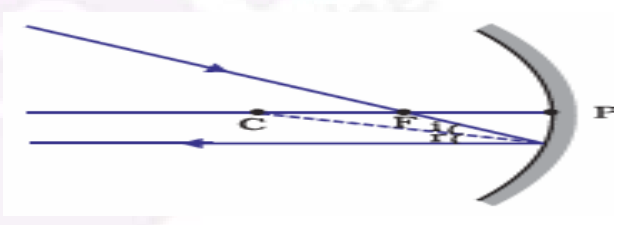
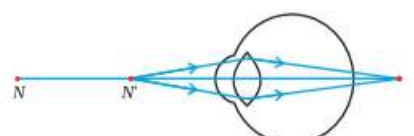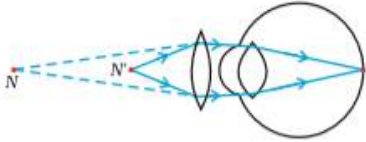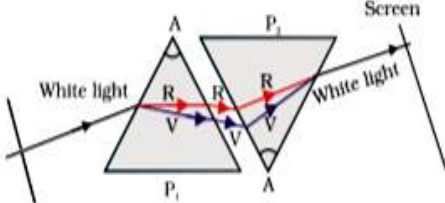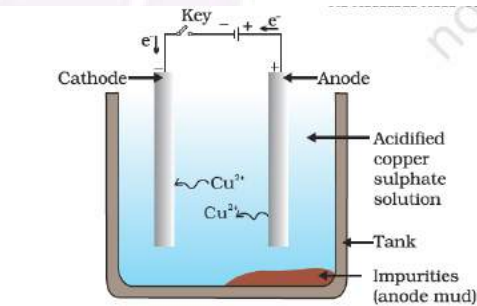**Series : JBB/2**   **SET-1**   **Paper Code No: 31/2/1**

S.NO	Value Points/Expected Answer	MARKS	TOTAL MARKS
	MARKING SCHEME- CLASS X SCIENCE (2019-20)		
	QUESTION PAPER CODE : 31/2/1		
	SECTION A		
1.	Due to weak intermolecular forces.		1
2	Two / Lithium and Beryllium		1
3.	(a) Are deeper hot regions of earth's crust where molten rocks are formed.	1	
	(b) New Zealand / United States of America / China/Indonesia, Philippines / Turkey/ New Mexico. (Any two)	½ + ½	
	(c) Electromagnetic Induction.	1	
	(d) In case of A.C. transmission of power/electricity takes place without much loss of energy.	1	4
4.	(a) In the neck region	1	
	(b) Thyroxine regulates carbohydrate, proteins and fat metabolism in the body./ It promotes growth of body tissue.	1	
	(c) Excess of secretion of throxine in the body /overactivity of the thyroid gland	1	
	(d) Can be controlled by including iodised salt in our diet. (or any other relevant answer)	1	4
5.	(b) / B,C and D OR		
5.	(d) /Opaque eye lens		1
6.	(c) / 8Ω		1
7.	(d) / $R_2 > R_1 > R_3$		1
8.	(c)/ Sugarcane and rice OR		
8.	(c) / Carbon monoxide		1
9.	(b) / Maharashtra		1
10.	(d) / x= Physical state of $KClO_3$ and KCl y = Reaction condition z= Physical state of O_2		1
11.	(b) / Clove oil		1
12.	(b) / Group 13 period 2 OR		
12.	(b) / X_2Y		1
13.	(a) / Both (A) and (R) are true and (R) is the correct explanation of the assertion.		1
14.	(d) / (A) is false, but (R) is true.		1
	SECTION B		
15.	(i) A = CaO / Quick lime/ Calcium oxide B = $Ca(OH)_2$ / Slaked lime / Calcium hydroxide	½ ½	
	(ii) $CaO + H_2O \rightarrow Ca(OH)_2 +$ heat or energy	1	

	(iii) Combination reaction Exothermic reaction		½ + ½	3
16.	(i) 2 formula units of $CaSO_4$ /Calcium sulphate share 1 molecule of water of crystallization.		1	
	(ii) due to its alkaline nature .		1	
	(iii) $CuSO_4 .5H_2O \rightarrow CuSO_4 + 5H_2O$ (Blue) (white) / Due to loss of water of crystallization.		1	
	OR			
	(i)		1	
	(ii) Wet litmus paper		1	
	(iii) HCl solution , it is due to the formation of H^+ ion on in the water / H_3O^+ (Hydronium ions)		½ + ½	3
17.	(a) A (b) D (c) B (d) C (e) A_2C (f) B & D		½ ½ ½ ½ ½ ½	3
18.	(a) Grass $\rightarrow$ Grass hopper $\rightarrow$ Frog $\rightarrow$ Snake (Or any other relevant example)		1	
	(b) Transfer of food energy to the next higher level will not take place , then the organisms of the upper trophic levels will be affected , increase in the population of the organisms belonging to the previous trophic level / imbalance in the food chain.		1	
	(c) 2000J $\xrightarrow{\text{10% Law}}$ 200 J $\xrightarrow{\text{10% law}}$ 20J II Trophic Level III Trophic Level IV Trophic Level		1	
	[If calculation of the amount of energy is not shown , deduct ½ mark .] **OR**			

	(a) (i) O_2
	    (ii) O_3
	    (iii) Breathing /Respiration
	    (iv) Absorbs harmful ultra violet (UV) radiations.
			½
			½
			½
			½	

	(b) $O_2 \xrightarrow{\text{uv}} O + O$ $O + O_2 \rightarrow O_3$		½ ½	3
19.	**Secretions**	**Functions**		
	(a) mucus	(d)Protects the inner lining of stomach from the acid / softening of food		

	(b) HCl(Hydrochloric acid)	(e)Provides the acidic medium for action of enzyme / Kill the germs.	½ x 6	
	(c) Pepsin	(f) Digest proteins		3
	(Note : a,b and c may in any order but there function must match / be given along with the secretion.			
20.	(i) **Homologous organs:** Mammals have forelimbs as do birds, reptiles and amphibians .The basic structure of the limbs is similar though it has been modified to perform different functions in various vertebrates. Therefore these are homologus organs.	1 ½	
	(ii) **Fossils:** Study of fossils of Archeopteryx / Dinosaurs show the presence of feathers used for insulation in cold weather but later became useful for flight. So birds have evolved from reptiles.	1 ½	3
21	• Chromosomes are thread like structures present in nucleus containing genetic material / DNA	1	
	• Number of chromosomes are reduced to half during gametes / germ cell formation .	1	
	After fertilization of germ cells the number of chromosomes is maintained in progeny.	1	3
22	(i)	1	
	(ii)	1	
	(iii)	1	3
23	(i) Galvanometer (G) shows deflection (for very short time)	1	
	(ii) Galvanometer (G) shows deflection for a very short time in opposite direction to the previous observation.	1	
	Common Reason: Due to variation in current flowing through coil 1, magnetic field associated with coil 2 changes. Due to which an induced current will generate consequently galvanometer shows momentry defelection.	1	3
24	(a) (i) Size of eyeball decreases		
	(ii) Focal length of eye lens is too long / Power of eye lens decreases.	½ + ½	
	(b) Diagrams :	1	

	Hypermetropic Eye	1	

Corrected Eye

OR

(a) Small size particles scatter shorter wavelength (violet) or large sized particles scatter larger wavelength (Red).   — 1
(b) Due to variation in physical condition of hot air.   — 1
(c) Diagram

(Splitting of white light is essential)   — 1

3

		SECTION C		
25	(a)			

(a)
- Metals high up in reactivity series cannot be obtained from their compounds by heating with carbon as carbon can not reduce the oxides of these elements while those in the middle of the reactivity series are extracted first by converting their sulphides or carbonates into oxides and then reducing by Carbon .   — 1
- It is because these metals have high affinity for oxygen than Carbon .   — ½
- Electrolytic reduction   — ½
- Sodium is obtained from its molten chloride by passing electricity.
- at Cathode : $Na^+ + e^- \rightarrow Na$
   at Anode   : $2Cl \rightarrow Cl_2 + 2e^-$ — ½ + ½

(b)

2

OR

(i) $2Cu + O_2 \rightarrow 2CuO$ — 1
(ii) $Al_2O_3 + 6HCl \rightarrow 2AlCl_3 + 3H_2O$ — 1
(iii) $2K + 2H_2O \rightarrow 2KOH + H_2$ — 1
(iv) $2HgS + 3O_2 \xrightarrow{\text{Heat}} 2HgO + 2SO_2$ — 1
(v) $Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$ — 1

5

26	(a)			
		• **Homologous series** is a group of compounds which have the same functional group , same general formula and where to successive member differ by – CH_2 in the molecular formula	1	
		Example : CH_3-OH , CH_3 -CH_2-OH Functional group : -OH , General Formula : C_nH_{2n} OH	1	
	(b)	**Esterification** : The reaction of carboxylic acid with an alcohol in the presence of H_2SO_4 yields an ester. $CH_3COOH + C_2H_5OH \xrightarrow[\text{Heat}]{\text{Conc .}H_2SO_4} CH_3COOC_2H_5 + H_2O$ Ester (If word equation given award full marks)	1 ½	
		Addition Reaction : A reaction in which two or more atoms are added across a double or triple bond in presence of catalyst is called addition reactions. $CH_2=CH_2 + H_2 \xrightarrow{\text{Pt./Pd or Ni}} CH_3-CH_3$	1 ½	5
27	(a)			
		• Nephron	1	
		• Structure : Cluster of blood capillaries / glomerulus is associated with cup shaped structure called Bowman's capsule, which leads to coiled tubular part of Nephron.	1½	
		Function : Collects the filtrate and reabsorbs useful substances like glucose, amino acids, salts and water from filtrate and forms urine.	1½	
	(b)	Amount of excess water in the body Amount of wastes dissolved	½ ½	5
28	(a)			
		• Chemical Method	½	
		• Barrier Method	½	
		• Surgical Method	½	
		(b) Increase in female foeticide / Declining child sex ratio (Any One)	1	
		Benefit : Maintaining male-female sex ratio for a healthy society	½	
		(c) Bacterial → Gonorrhoea	½	
		Syphilis	½	
		Viral → Warts	½	
		AIDS	½	
		OR		
		(a) (i) Ovary→ Production of female germ cell/egg Production of hormone – estrogen (Any one)	1	
		(i) Oviduct→ Site of fertilization	1	
		(b) (i) Thickening of the uterus lining	1	
		(ii) Wall of uterus breaks/Menstruation occurs.	1	
		(c) Providing the nutrition / O_2/to the developing embryo /foetus or removal of waste from the fetus.	1	5

| 29	(a) $R = \rho \dfrac{l}{A}$		
	$R_x = \rho \dfrac{l_x}{A_x} = \dfrac{30}{\pi \times 2 \times 2}$	½	
	$R_y = \rho \dfrac{l_y}{A_y} = \rho \dfrac{10}{\pi \times 1 \times 1}$	½	
	$\dfrac{R_x}{R_y} = \dfrac{\rho . l_x}{A_x} \times \dfrac{A_y}{\rho . l_y}$		
	$= \dfrac{30}{\pi \times 2 \times 2} \times \dfrac{\pi \times 1 \times 1}{10}$	½	
	$\dfrac{R_x}{R_y} = \dfrac{3}{4}$		
	$R_x : R_y = 3:4$	½	
	(b) Here $I = 500$ mA ; Resistance of lamp $= R_1$		
	Resistance of the conductor $(R_2) = 10\ \Omega$		
	Pot. Difference $(V) = 6$ volt		
	Net resistance of the circuit $R = R_1 + R_2 = \dfrac{V}{I}$	½	
	$R_1 + 10\ \Omega = \dfrac{6}{0.5}$	1 ½	
	$R_1 + 10\ \Omega = 12\ \Omega$ $R_1 = (12-10)\ \Omega$		5
	$= 2\ \Omega$	1	
30.	(a) (i) Real and magnified		
	Object distance must be between 10 to 20 cm	1 ½	
	(ii) Virtual and magnified		
	Object distance must be less than 10 cm	1 ½	
	(b) $f = 10$ cm ; $u = -10$ cm		
	$\dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{f}$	½	
	$\dfrac{1}{v} = \dfrac{1}{f} - \dfrac{1}{u}$		

$$\frac{1}{v} = \frac{1}{10} - \frac{1}{-10}$$

$$\frac{1}{v} = \frac{1}{10} + \frac{1}{10}$$

1

$$\frac{1}{v} = \frac{1}{5} \therefore v = 5cm$$

½

OR

(a) (i) Ability of a lens to converge or diverge light rays/reciprocal of focal length of lens.

1

(ii) It is a point on principal axis at which light ray parallel to principal axis converges after reflection.

1

(b) (i) for spherical lens : $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

½

(ii) for spherical mirror : $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

½

(c)

2
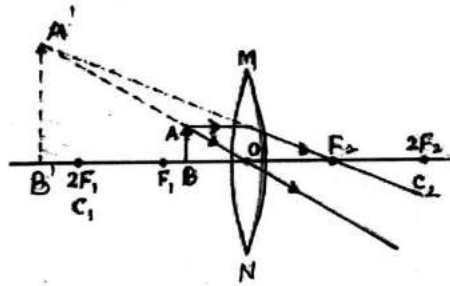
Distance of object (BO) = 10 cm

Focal length (OF$_1$) = 15 cm

5

(If the distance in the diagram are not marked , deduct ½ marks)