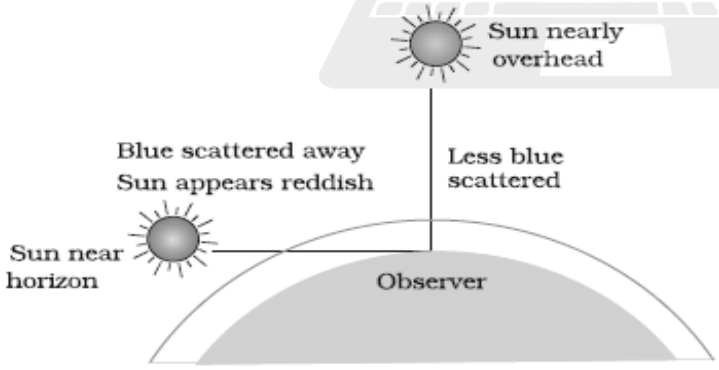
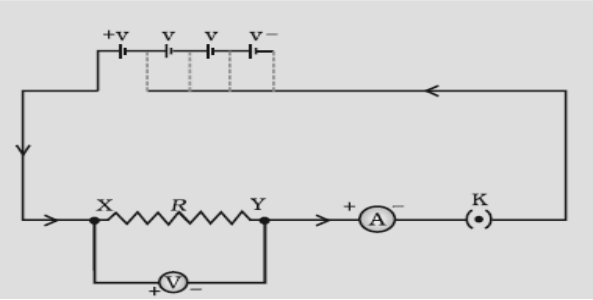
CBSE Class 10 Science Question Paper Solution 2020 Set 31/1/1

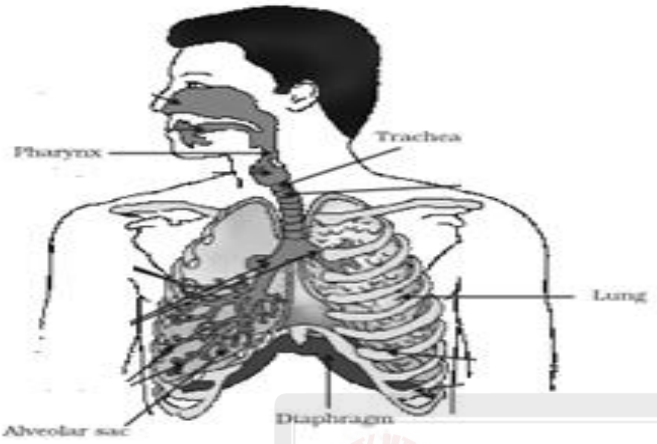
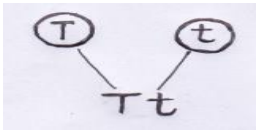
Series: JBB/1 SET-1 **Paper Code No: 31/1/1**

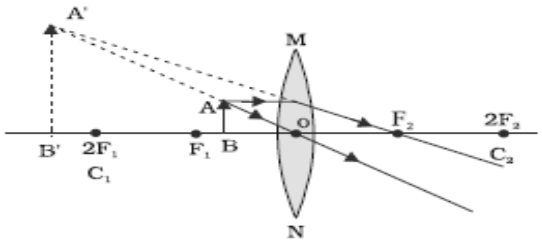
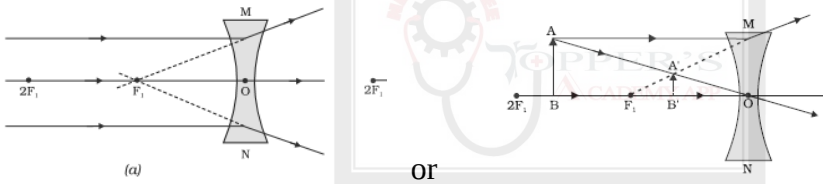
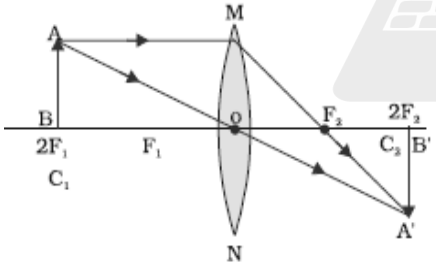
MARKING SCHEME – CLASS X SCIENCE (2019-20)			
QUESTION PAPER CODE: SET 31/1/1			
S.NO	**VALUE POINTS/EXPECTED ANSWER**	**MARKS**	**TOTAL MARKS**
	SECTION A		
1.	Cyclopentene / Cyclohexene-formula or structure (or any other). If candidate writes Benzene give full mark	1	1
2	Electromagnetic Induction	1	1
3.	a) Thick hair growth in armpits, genital area/thinner hair on arms, legs, face/ more active oil secretion from glands on skin/Occurrence of pimples **(any two)** b) Imbalance in male – female ratio/ decline in child sex ratio c) Oral pills d) Rate of birth and death	½ + ½ 1 1 1	4
4.	a) Human beings are at the top level in any food chain b) Washing of vegetables, fruits, grains thoroughly/Organic farming/ Use of bio pesticides **(any one)** c) (b) / Trophic level d) (a) / Consumer	1 1 1 1	4
5.	(d) / (A) and (B) OR (d)/ Double displacement reaction	1	1
6.	(d) / (B), (C) and (D)	1	1
7.	(c)/ Sodium hydrogen carbonate and tartaric acid **[Note**: If a candidate writes 'none of the options is correct'/ 'sodium hydrogen carbonate' give full credit.]	1	1
8.	(c) / $CaSO_4.\frac{1}{2}H_2O$	1	1
9.	(d) / All reflecting surfaces OR (d) / Virtual and erect	1	1
10.	(d) / Increases heavily OR (d) / 1A	1	1
11.	(d) / Afforestation	1	1
12.	(b) / (A) and (D)	1	1
13.	(b) / Both (A) and (R) are true but (R) is not the correct explanation of the assertion (A).	1	1
14.	(a) / Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).	1	1
	SECTION B		
15.	• A black colour is formed on the surface $2Cu + O_2 \xrightarrow{\text{Heat}} 2CuO$ Brown Copper Oxide; Black Colour	½ ½ ½	

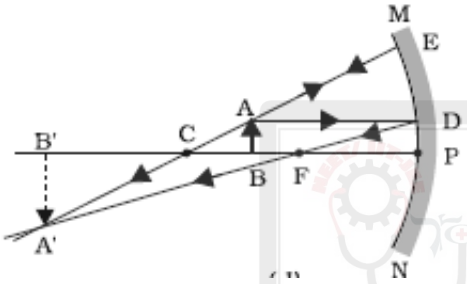
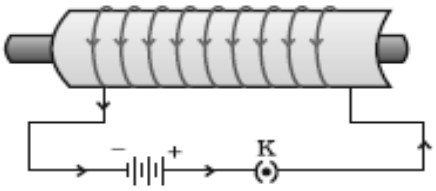
	• Original/brown colour is restored. Heat $CuO + H_2 \Longrightarrow Cu + H_2O$ Black Copper; Brown	½ ½ ½	 3
16.	Products: Hydrogen, Chlorine , Sodium hydroxide Uses: Hydrogen: In the production of margarine/ ammonia/as a fuel Chlorine: Water treatment/ swimming pools/ production of PVC/ Disinfectants/CFCs/Pesticides. Sodium hydroxide: For degreasing metal surfaces/ in making soaps and detergents/ paper making/ artificial fibres. **(any one use of these or any other)** OR • By recrystallisation of sodium carbonate • $Na_2CO_3 + 10H_2O \longrightarrow Na_2CO_3.10H_2O$ • Basic Salt • Permanent hardness	1 ½ ½ × 3 1 1 ½ ½	 3
17.	i) By dissolving 5g of $KMnO_4$ in 100mL of water/ By dissolving 5g of $KMnO_4$ in water to make a final volume of 100 mL. ii) As an oxidizing agent Purple colour persists iii) $CH_3CH_2OH \xrightarrow[\text{heat}]{\text{Alkaline } KMnO_4} CH_3COOH$	1 ½ ½ 1	 3
18.	• The adrenaline hormone is secreted into the blood. • The heart beats faster resulting in supply of more oxygen to the muscles. • Blood is diverted to skeletal muscles. • The breathing rate increases. • The blood supply to digestive systems and skin is reduced. OR • Electrical impulses have limited access to only those cells that are connected by nervous tissue/ neurons, whereas chemical signals can reach each and every cell of the body . • Cells need time to reset in order to create repeated/ new electrical impulses whereas no such time is required for chemical communication.	1 ½ ½ ½ ½ 1 ½ 1 ½	 3
19.	• Pollination is the transfer of pollen from anther to stigma Self Pollination: Transfer of pollen in the same flower Cross Pollination: Transfer of pollen from one flower to another. • Pollination leads to fertilization resulting in the formation of zygote.	1 1 1	 3

20.	• Homologous structures are those which have similar basic structure and origin but perform different functions. • Example: forelimbs of reptiles, amphibians, humans, wings of birds **(or any other example)** • Yes • Similarity in basic design of the structure indicates that their ancestors were common.	1 ½ ½ 1	3
21.	Because of scattering of light. Instances: • When a fine beam of light enters a smoke-filled dark room through a small hole. • When sunlight passes through a canopy of dense forest in foggy/ misty conditions. • Blue colour of sky. • Red colour of the sun during sunrise or sunset. **(or any other)** OR • Prism has 2 inclined refracting surfaces whereas a glass slab has 2 parallel refracting surfaces. i) When monochromatic light passes through a glass slab it gets displaced laterally whereas in prism it gets angularly displaced. ii) When white light passes through a glass slab, it gets laterally displaced whereas in prism, dispersion takes place.	1 ½ × 4 1 ½ ½ ½ ½	3
22.	 Diagram Labelling	1 ½ × 4	3

23.	$V \alpha I$ **or Potential difference is directly proportional to current**  **Note:** If circuit diagram is correct but labelling of ammeter and voltmeter are incorrect, deduct 1 mark.	1 2	 3
24.	i) $H = I^2Rt$ *ii)* $H = V.I.t$ $= V.Q$ Given : $V = 40$ volts , $Q = 96000$ C $H = 40\ V \times 96000\ C$ $= 3.84 \times 10^6$ J	1 ½ 1 ½	 3
	SECTION C		
25.	• These metals have more affinity for oxygen than carbon. • Towards the top of the reactivity series . • By electrotytic reduction of their molten ores. • Example : Extraction of sodium from molten sodium chloride by electrolysis. Process : • Molten NaCl is taken in an electrolytic cell and on passing electricity Na is deposited at cathode and chlorine is liberated at anode . Reactions – At cathode - $Na^+ + e^- \rightarrow Na$ At anode - $2Cl^- \rightarrow Cl_2 + 2e^-$ (or any other example)	1 1 1 1 ½ ½	 5
26	i) E, it has 4 valence electrons . ii) B, it needs only 2 electrons to attain stable configuration. iii) D , it loses two electrons to attain stable configuration . iv) F, it has the largest size since size increases down the group. v) Noble gases, outermost shell is complete. OR • Atomic size is the distance between the centre of the nucleus and the outermost shell of an isolated atom. • Picometer /pm • Trends in Atomic radius In a group: increases down the group ; due to addition of a new shell .	½ + ½ ½ + ½ ½ + ½ ½ + ½ ½ + ½ 1 1 ½ 1	

	In a period: atomic radius decreases from left to right ; due to increase in pulling power of nucleus / due to addition of electrons in the same shell.	½ 1	5
27	a) Rate of breathing is faster in aquatic organisms because the amount of dissolved oxygen in water is lower as compared to the amount of oxygen in air. b)  Diagram 5 labellings OR a) A pair of kidneys, a pair of ureters, a urinary bladder and a urethra. b) A kidney has a large number of filteration units called nephrons. Each nephron has cup shaped Bowman's capsule containing a bunch of capillaries called glomerulus. Blood gets filtered in the glomerulus. Filterate gets collected in Bowman's capsule. Some useful substances such as glucose, amino acids, salts and water are selectively reabsorbed as urine flows through nephron tube. The urine formed in each kidney is eventually stored in the urinary bladder	½ 1 1 ½ x 5 ½ x 4 ½ ½ ½ ½ ½ ½	5
28	a) Law of dominance of traits: -In a cross between a pair of contrasting characters, only one parental character will be expressed in F_1 generation which is called dominant trait and the other is called recessive trait. For example – in pea plants, Tall Dwarf /Short Parents TT tt Gametes  F_1 All Tall	1 ½ ½	

	All plants in F1 generation were tall proving that the gene for tallness is dominant over the gene for dwarfness/ short, which is not able to express itself in the presence of dominant trait. (any other example)	1	
	b) Traits acquired by an organism during its lifetime are known as aquired traits. These traits are not inherited because they occur in somatic cells only/do not cause any change in the DNA of the germ cells.	1 1	5
29	i)  ii)  iii)  In case (i) sign is positive and m> 1 (ii) sign is positive and m < 1 OR Given h = + 4.0 cm, u = -25.0 cm, f = -15.0 cm i) image distance v = ? ; mirror formula : $\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$ or $\frac{1}{v}=\frac{1}{f}-\frac{1}{u}$; $=-\frac{1}{15}-(-\frac{1}{25})$	1 1 1 ½ + ½ ½ + ½ ½ ½ 1	

	$= \frac{-1}{15} + \frac{1}{25} = \frac{-5+3}{75}$ $= \frac{-2}{75}$ v = - 37.5 cm The screen should be placed 37.5 cm in front of the mirror.	½	
	ii) m = $\frac{h^1}{h} = -\frac{v}{u}$	½	
	: $h^1 = -\frac{v}{u}$. h	½	
	$= -\frac{(-37.5 \times 4)}{-25}$ h^1 = - 6.0 cm (size of the image).	½	
	iii)  Note: Deduct half mark for not showing arrows in ray diagrams.	1	5
30	a) A current carrying solenoid is called an electromageet /when soft iron is placed inside a solenoid carrying current, the soft iron piece behaves like a magnet so long as electric current passes through it. The magnet so formed is electromagnet.	1	
	Uses: In electric motors, electric bells, (or any other)	½ + ½	
	b)  (Direction of current)	1 ½	
	c) Soft iron core is used to increase the strength/power of the electro magnet.	½	
	d) i) By increasing the current ii) By increasing the number of turns in the coil.	½ + ½	5