SET 31 / 5 / 1.

Q.N 0	Value Point/Expected Answer	Value	Tota l Mar ks
1.	SECTION – 'A'		
	Ohm's law states that potential difference(V) is directly proportional to the current (I) flowing through the conductor provided the all physical conditions (temperature etc.) remains constant.	1	1
2.	i. Nitrogen ii. Phosphorous	1/ ₂ 1/ ₂	1
	SECTION-'B'		
3.		Ó.S	
	(i) draw mirror.	1/2	
	(ii) Complete ray diagram (iii) ∠i and ∠r islabelled	1/2	
	(iii) ∠i and ∠r islabelled(iv) Arrows marked	1/ ₂ 1/ ₂	2
4.	(a) More deflection in compass needle ,Magnetic field is increased.		2
4.	(a) More deflection in compass needle, Magnetic field is reduced/decreased.(b) Less deflection in compass needle, Magnetic field is reduced/decreased.	1 1	2
5.	 Acetic acid (CH₃COOH) is a weak acid because it has less concentration of hydronium ion (H₃O⁺/H⁺) 	1	
	• eg. Zinc granules react with dil HCI very vigrously and liberate Hydrogen gas but in case of acetic acid, it reacts slowly to liberate hydrogen gas.	1	
	OR • Sodium hydrogen carbonate (NaHCO ₃) is a basic salt because NaHCO ₃ is a combination of strong base and weak acid.	1	
	• $2\text{NaHCO}_3 \xrightarrow{Heat} \text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$	1	2
	SECTION -'C'		
6.	The branch of biology which deals with the study of heredity and variation.	1	

	The decrease in the number of surviving tigers is a cause of concern because fewer number of tigers impose extensive inbreeding among themselves, this limits the appearance of variation and put the species at a disadvantage if there are changes in the environment. Since the tigers fail to cope with the environmental changes, they may become extinct.	1	2
7.	$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$	1/2	
	$\frac{1}{u} = \frac{1}{-20} + \frac{1}{30}$		
	u = -60cm(without unit (cm) deduct ½ mark)	1	
	$m = \frac{-v}{u}$	1/2	
	$m = -\left[\frac{-30}{-60}\right]$	40	
	$m = \frac{1}{2}$	A.,	
	$\frac{h_2}{h_1} = m$		
	$h_2 = h_1 \times m$ $h_2 = 4 \times \left[\frac{-1}{2}\right]$ $h_2 = -2 \text{ cm}$		
	$h_2 = -2 \text{ cm}^2$	1	
	$m = \frac{v}{u}$		
	$m = \frac{2}{3}$ $-\frac{2}{3} = \frac{v}{-12}$ $v = 8 \text{ cm}$	1/2	
	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	1/2	
	$\frac{1}{f} = \frac{1}{8} - \frac{1}{-12}$	1/2	
	$\frac{1}{f} = \frac{1}{8} + \frac{1}{12}$		
	$\frac{1}{f} = \frac{5}{24}$		

	$f = \frac{24}{5}$	1 1/2	3
	f = 4.8 cm	, 2	
8.	 (a) Observations : i. Colour changes from green to white. ii. Formation of reddish brown Ferric oxide (Fe₂O₃) / evolution of SO₂ / SO₃ gas. 	1/2+ 1/2	
	(b) Decomposition reaction	1	
	(c) 2FeSO_4 Heat Fe_2O_3 + SO_2 + SO_3 Ferric oxide Sulphur dioxide Sulphur trioxide	1	
	Or		
	(a) When copper is heated in air, oxidation takes place.	1	
	(b) CuO /Copper oxide.	1/2	
	$(c) 2 Cu + O_2 \longrightarrow 2 CuO$	1	3
	(d) On passing hydrogen gas over the heated material.	1/2	3
9.	The series of living organisms taking part at various biotic level forms a food chain.	1	
	 (i) An average of 10% of the food eaten is turned into its own body and made available for the next level of consumers (ii) The energy that is captured by the autotrophs does not revert back to the 		
	solar input. (iii) The energy which is passed to the herbivores does not come back to the autotrophs.	1+1	
	(iv) As it moves progressively through the various trophic levels it is no longer available to the previous level.		
	[Any two] OR		
	(a) Since interference will create disturbances in the protected area (National Park) / To maintain the selfsustainability in the protected area (b) Reuse of materials is better than recycling because	1	
	 the process of recycling use some energy, in the reuse strategy things are used again and again. (If example is given then also award marks .) 	1+1	3
10.	It consists of sodium hydrogen carbonate and tartaric acid.	1)
	 Sodium hydrogen carbonate release carbon dioxide gas which makes cakes soft and fluffy and Tartaric acid neutralizes the bitter taste of the salt. 	1	

	• 2Na HCO ₃ Heat Na ₂ CO ₃ + CO ₂ + H ₂ O	1	3
	ŕ	1	3
11.	 It will show deflection Change in magnetic field lines associated with coil Q gives induced current 	¹ / ₂ 1	
	 No deflection Because there is no change in magnetic field lines associated with coil 'Q'. So no induced current. 	1/2	3
12.	(a) • Xylem vessels and Xylem tracheids	1	
	 At the roots, cells in contact with the soil actively take up ions. Creates a difference in concentration of ions So water moves up. 	1	
	(b) Plants do not move and have large proportion of dead cells in many tissues. Thus plants have low energy needs.	1	3
13.		(A)	
	Synapse Dendrite of next neutron This flow is unidirectional. (can award marks if student writes in a descriptive manner)	½ x6	
14.			3
14.	 Global warming, melting of glaciers (or any other appropriate answer) - More efficient lighting (CFL or LED) 	1	3
1 'T .		1	
	 - More efficient lighting (CFL or LED) - Upgrade heating system - Use of public transport (metro, bus) 		3
15	 - More efficient lighting (CFL or LED) - Upgrade heating system - Use of public transport (metro, bus) - Choosing renewable sources of energy (or any other) Carbonate ore 	1 1/2 x 4=2 1/2	
15	 More efficient lighting (CFL or LED) Upgrade heating system Use of public transport (metro, bus) Choosing renewable sources of energy (or any other) Carbonate ore Zinc Carbonate Calcination ZnCO₃ Heat ZnO+ CO₂ In limited supply of air Reduction: ZnO+ C Zn + CO 	1 1/2 x 4=2 1/2 1/2 1/2	
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	(i)	Covalent compounds are bad conductor of electricity as they do not have free electrons .	1	
	(ii)	Due to weak forces of attraction between the molecules ,thus less energy is required for breaking the bonds.	1	
	(b)Stru	cture of Benzene H C C C H H C C C H H H C C C H H H H	1	
		Or		
		mers are those compounds which have the same molecular formula but different uctural formula	1	
	(b)	• Propanal CH ₃ CH ₂ CHO	1+1	
		• Propanone CH ₃ COCH ₃	Ó.A.	
	(c) (i)	CH ₃ CH ₂ OH $443 \text{ K} \text{ H}_2\text{C}=\text{CH}_2 + \text{H}_2\text{O}$ Conc. H ₂ SO ₄	1+1	
	(ii)	CH ₃ CH ₂ OH Alkaline KMnO ₄ CH ₃ CH ₂ COOH + H ₂ O Heat		5
17.	f= 20 cm (a)	u = -30 cm		
	(i)	$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$	1/2	
		$\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$		
		$\frac{1}{v} = \frac{1}{20} + \frac{1}{-30}$		
		$\frac{1}{v} = \frac{1}{60}$		
		v= 60 cm	1/2	
	(ii)	Real, inverted and magnified	1½	
	(iii)	$m = \frac{v}{u}$	1/2	
		$m = \frac{60}{-30}$		
		m = -2	1/2	
		$h' = m \times h$		

	$h' = -2 \times 5$	17	
	h' = -10 cm	1/2	
	(b)		
	C. P. AP. P. C.	1	5
18.	(a)		
	i. In a periodMetallic character decreases. e.g.In 3 rd period Na is more metallic than Cl	$\frac{1}{2} + \frac{1}{2}$	
	ii. In a group Metallic character increases.	1/2 + 1/2	
	e.g. K is more metallic than Na.		
	(b)Covalent bond, XCl ₄	$\frac{1}{2} + \frac{1}{2}$	
	(c)	X	
	• Atomic number = Mass number -no. of neutrons = 35 - 18 = 17	1	
	• Electronic configuration = K, L, M 2 8 7	1/2	
	• Valency = - 1	1/2	5
19.	(A) • $R = R_1 + R_2$ $R = 1\Omega + 2\Omega$	1/2	
	$R = 3\Omega$	1/2	
	$ \bullet V = IR I = V/R $		
	$I = \frac{6V}{3\Omega} = 2 \text{ Ampere or 2 A}$	1	
	$\bullet P = I^2 R$		
	= 2x2x2 $= 8 W$	1	
		1	
	(B) $P = V^2/R$ $P = \frac{4x^4}{2}$	1	
	$P = \frac{1}{2}$ $P = 8 \text{ W}$	1	
	OR		

	(i) $P = 40 \text{ W}$ V = 220 V P = VI $I = \frac{P}{V} = \frac{40 \text{ W}}{220 \text{ V}}$ = 0.18 A	1	
	(ii) $R = \frac{V^2}{R}$		
	$= \frac{220 \times 220}{40}$ = 1210 \Omega	1	
	(iii) $P = 25 \text{ W}$ V = 220 V P = VI		
	$I = \frac{P}{V} = \frac{25}{220} = 0.113 \text{ A}$	1	
	(iv) $R = V^2/R$ = $\frac{220 \times 220}{25}$ = 1936 Ω	1	
	(v)Yes there is a change in current and resistance	1	
			5
20.	(a) Cross Pollination Self Pollination		
	1. Pollen is transferred from anther/stamen of one flower to the stigma of another flower. 1. Transfer of pollen from anther/stamen to the stigma of the same flower.	1	
	• Site of fertilization – Ovary	1/2	
	• Product of (b) Stigma Ovary Female germ-cell	tote ½	

Correct diagram 1	
Correct labelling ½x4=2	
Correct rabelling 72x4-2	
OR	
Oviduct or Fallopian tube Ovary	
Correct diagram	
(i) Ovary	
(ii) Oviduct or fallopian tube	
(b)Syphillis and Gonnorhoea	
(c)Chemicals or materials required to avoid pregnancy	
Reasons for adopting contraceptive devices are – 1	
(i) Controlling human population (ii) To maintain good reproductive health (iii) Maintain gaps between successive birth 1/2x2=1	5
21. (a) (i) Homologous organs, which have similar basic structures but have different functions. e.g. Forelimbs of human and forelimbs of Lizard . 1/2 +1/2	
(ii) Analogous organs are those which have different basic structure but perform similar function. e.g. Wings of insect and wings of bat.	
(iii) Fossils are remains or impression of the dead animals and plants that lived in the past. e.g. Archeopteryx or any other example $\frac{1}{2} + \frac{1}{2}$	
(b) Methods to determine the age of fossils:	
(i) Relative dating: Fossils which are found closer to the surface are more recent than those in deeper layers.	
(ii) Dating Fossils: Detecting the ratios of different isotopes of the same element (C)in the fossil.	5
22. SECTION - 'E'	

	The solution turns		
	i. green to colourless and	1/2 +1/2	
	ii. black coating is formed on Zinc .		
	Reason: Zinc is more reactive than iron so it displaces the iron from its salt solution.	1	2
23.	No change / As acid turns blue litmus to red , so there is a need of blue litmus paper . To get the blue litmus dip the red litmus paper into a basic solution and get blue colour .	2	
	OR		
	(i) Sodium hydrogen carbonate (NaHCO ₃) or Sodium Carbonate (Na ₂ CO ₃)	1/2	
	(ii) $2CH_3COOH + Na_2CO_3 \longrightarrow 2CH_3COONa + H_2O + CO_2$	1	
	CH ₃ COOH +NaHCO ₃		
	(iii) Liberated CO ₂ is passed through lime water, which is turned to milky.	1/2	2
24.	(c) (20 cm, 20 cm) and (inverted and inverted)	1	2
	Reason: Only real and inverted image can be obtained on the screen and in both cases the image is formed at the principal focus.	1	2
25.	(i) 38mA, 3.2 V	1+1	
	Or		
	 (i) V∝I (ii) at 2.5 V current will be 0.25 A 	1 1	2
26.	Safranin is used to stain/colour the material for better view.	1	
	Glycerine prevents the leaf peel from getting it dried.	1	2
27.	Conviedon Radicle Correct Diagram and Labelling	1/2 +11/2	
	OR		
	34-34-34		
	Diagram	1	
	Decore D. 11:	1	
	Process – Budding	1	2