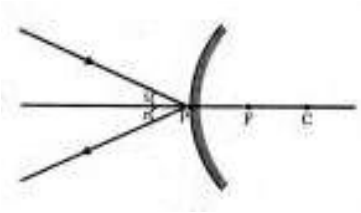
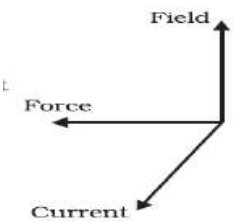
CBSE Class 10 Science Solution PDF

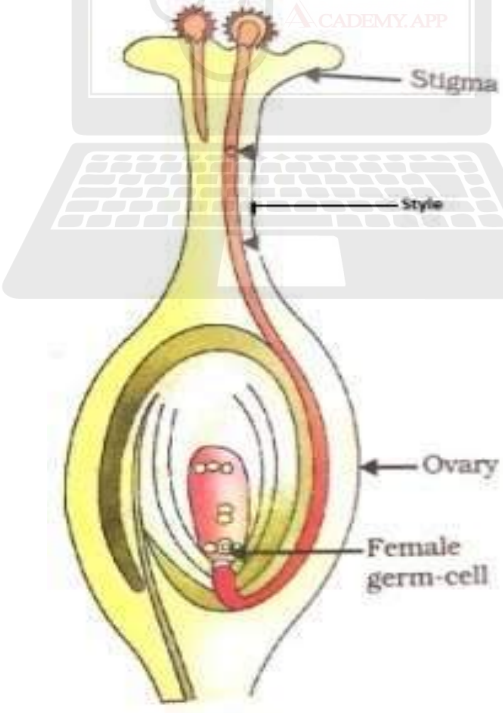
SET 31 / 5 / 3

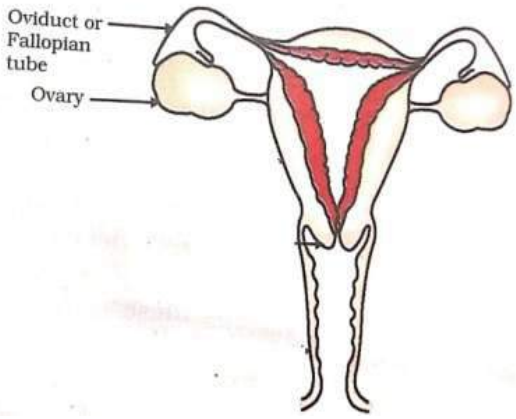
Q.No.	Value point/ Expected answer	Value	Total marks
1.	Section-A R= $\frac{V}{I}$ =$\frac{5}{0.2}$ =2.5 Ω	 ½ ½	 1
2.	• Storage and disposal of spent or used fuel.		1
3.	Section-B  • Correct ray diagram • labelling of ∠iand∠r	 1 ½ x2=1	 2
4.	Principle : When current carrying coil is placed in a magnetic field ,it experiences force as per Fleming's left hand rule. **Fleming's left hand rule**: According to Fleming's left hand rule, stretch the thumb, forefinger and middle finger so that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger in the direction of current, then the thumb will point the direction of force acting on the conductor.  atement or for the diagram)	1 1	 2
5.	• Formic acid / Methanoic acid HCOOH • Putting a solution of weak /mild base like baking soda.	½ ½ 1	

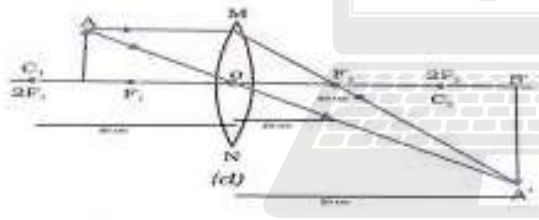
	Or (a) • Acid + Phenolphthalein----------->Colourless Base+ Phenolphthalein----------> Pink colour (b) • Acid + Methyl Orange ----------> Red Base + Methyl Orange ----------> Yellow	½ ½ ½ ½	2
6.	Section-C The series of living organisms taking part at various biotic level forms a food chain. (i) An average 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. (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 (v) Reuse of materials is better than recycling because the process of recycling use some energy, in the reuse strategy things are used of again and again	1 1+1 1 1+1	3
7.	Dam is a barrier built across a river or a stream for storage of water. Advantage: i. Storage of adequate water for irrigation. ii. Generation of electricity Ill effects : i. Social problems ii. Economic problems iii. Environmental problems (any two ill effects)	1 ½ ½ ½ x2=1	3
8.	• Xylem vessels and Xylem tracheids • At the roots, cells in contact with the soil actively take up ions. • Creates a difference in concentration of ions • So water moves up. (b) Since plants do not move and have large proportion of dead cells in many tissues Thus plants have low energy needs.	1 1 1	3

9.	Control and coordination of functioning of various systems is under the direct Control of nervous system. It is the nervous system which governs the way, a particular organ has to work .This control is achieved by complex network of neurons which carry signals in the form of electric impulse, to and from the brain. The hormonal system on the other hand co-ordinates the functioning of nervous system. The hormonal system has indirect control on various functions. It tells a system to either slow down or pace according to the situation. Nervous and hormonal systems are complimentary to each other thus we can say that nervous and hormonal system perform their function of control and coordination together . (award marks according to the appropriate correct answer)		3
10.	• The branch of biology which deals with the study of heredity and variation. • 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	3
11.	(a) Observations: • Colour changes from green to white • Formation of reddish brown Ferric oxide (Fe_2O_3)/evolution of SO_2/SO_3 gas. (b) Decomposition reaction (c) $2FeSO_4 \xrightarrow{Heat} Fe_2O_3 + SO_2 + SO_3$ Ferric oxide Sulphur dioxide Sulphur trioxide Or (a) When copper is heated in air, oxidation takes place (b) CuO/Copper oxide (c) $2\ Cu + O_2 \longrightarrow 2\ CuO$ (d) On passing hydrogen gas over the heated material	½ ½ 1 1 1 ½ 1 ½	3
12.	• A -----Cl_2(Chlorine gas) • B------$CaOCl_2$ (Calcium oxychloride) • $2NaCl + 2H_2O \text{------} \rightarrow 2NaOH + Cl_2 + H_2$ $Cl_2 + Ca(OH)_2 \text{-----} \rightarrow CaOCl_2 + H_2O$	½ ½ 1 1	3
13.	• Carbonate ore Zinc Carbonate • Calcination $ZnCO_3 \xrightarrow[\text{In limited supply of air}]{Heated} ZnO + CO_2$ • Reduction:	½ ½ ½ ½ ½	

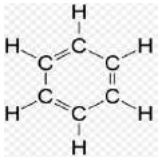
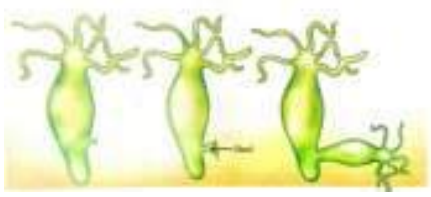
	$ZnO + C \longrightarrow Zn + CO$	½	3
14.	$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ $\frac{1}{u} = \frac{1}{20} + \frac{1}{30}$ u = -60cm (without unit (cm) deduct ½ mark) $m = \frac{-v}{u}$ $m = -[\frac{-30}{-60}]$ $m = -\frac{1}{2}$ $\frac{h_2}{h_1} = m$ $h_2 = h_1 \times m$ $h_2 = 4 \times [\frac{-1}{2}]$ $h_2 = -2$ cm or $m = \frac{v}{u}$ $m = -\frac{2}{3}$ $-\frac{2}{3} = \frac{v}{-12}$ $v = 8$ cm $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{f} = \frac{1}{8} - \frac{1}{-12}$ $\frac{1}{f} = \frac{1}{8} + \frac{1}{12}$ $\frac{1}{f} = \frac{5}{24}$	½ 1 ½ 1 ½ 1 ½ ½	

	$f = \frac{24}{5}$ = 4.8 cm	½	3
15.	• Closeness (crowding) of magnetic field lines is directly related to the strength of the magnetic field. • Strength of magnetic field at point 'A' (Pole) is more than at point 'B'. • If the student redraws the diagram and mark the arrows correctly (N to S).	1 1 1	3
16.	Section –D (a) Cross Pollination: 1. Pollen is transferred from anther/stamen of one flower to another flower. Self Pollination: 1. Transfer of pollen from anther/stamen to the stigma of the same flower. • Site of fertilization – Ovary • Product of fertilization – Zygote (b)  Correct diagram Correct labelling	1 ½ ½ 1 ½ x 4	

	OR (a)  Correct diagram i. Ovary ii. Oviduct or fallopian tube (b) Syphillis and Gonnorhoea (c) Chemicals or materials required to avoid pregnancy (i) Controlling human population (ii) To maintain good reproductive health (iii) Maintain gaps between successive birth } any two	1 ½ + ½ 1 1 ½ x 2	5
17.	(a) When the gametes from male and female parent combine during sexual reproduction to form zygote, they contribute equal amount of DNA(half each). The normal body cells of human contain 46 chromosomes each. Human sperm cells and egg cells both have 23 chromosomes .So the combination of these 23 chromosomes from male and female each during sexual reproduction ensures equal genetic contribution to progeny (23+23 = 46). (b) • Animals have a vast diversity in structures, they probably do not have a common ancestry because common ancestry may greatly limit the extent of diversity. • Many of these diverse animals are inhabiting the same habitat , the evolution by geographical isolation and speciation is not likely to happen.	3 1 1	5
18.	f= 20 cm, u = -30 cm (a)		

	(i) $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$ $\frac{1}{v} = \frac{1}{20} + \frac{1}{-30}$ $\frac{1}{v} = \frac{1}{60}$ v= 60 cm (ii) Real, inverted and magnified (iii) $m = \frac{v}{u}$ $m = \frac{60}{-30}$ m = -2 h' = m x h h' = -2 x 5 h' = -10 cm 	½ ½ 1½ ½ ½ ½ 1	5
19.	(A) • $R = R_1 + R_2$ $R = 1\Omega + 2\Omega$ $R = 3\Omega$ • $V = IR$ $I = V/R$ $I = \frac{6\,V}{3\Omega} = 2$ Ampere or 2 A • $P = I^2 R$ $= 2x2x2$ $= 8$ W (B) $P = V^2/R$ $P = \frac{4x4}{2}$ P = 8 W	½ ½ 1 1 1 1	

	OR (i) P = 40 W V = 220 V P = VI I = $\frac{P}{V} = \frac{40\ W}{220\ V}$ = 0.18 A (ii) R = $\frac{V^2}{R}$ = $\frac{220\ X\ 220}{40}$ = 1210 Ω (iii) P = 25 W V = 220V P = VI I = $\frac{P}{V}$ = $\frac{25}{220}$ = 0.113 A (iv) R = V^2/R = $\frac{220\ X\ 220}{25}$ = 1936 Ω (v) Yes there is a change in current and resistance	1 1 1 1 1	5
20.	(a) Element with smallest atomic radius -------- Fluorine /F (b) Element with maximum valency--------- Carbon /C (c) Element which is metalloid --------- Boron /B (d) Element which is most electropositive -------- Lithium /Li (e) CO and CO_2	1 1 1 1 1	5
21.	(a) • Carbon cannot form C^{4+} ions as very high energy is required to remove 4 electrons • Carbon cannot gain 4 electrons to form C^{4-} ions as 6 protons cannot hold 10 electrons (i) Co-valent compounds are bad conductor of electricity as they do not have free electrons. (ii) Due to weak forces of attraction between the molecules, thus less energy is required for breaking the bonds	1 1 1 1	

	(b) 	1	
	Or		
	(a) Isomers are those compounds which have the same molecular formula but different structural formula.	1	
	(b) • Propanal ---------- CH_3CH_2CHO • Propanone ---------- CH_3COCH_3	1+1	
	(c) (i) $CH_3CH_2OH \xrightarrow[\text{Conc. } H_2SO_4]{443\ K} H_2C{=}CH_2 + H_2O$	1+1	
	(ii) $CH_3CH_2OH \xrightarrow[\text{Heat}]{\text{Alkaline } KMnO_4} CH_3CH_2COOH + H_2O$		5
22.	Section –E (c) (20 cm, 20 cm) and (inverted and inverted)	1	
	Reason: Only real and inverted image can be obtained on the screen and in both cases image is formed at the principal focus.	1	2
23.	38 mA, 3.2 V Or	1+1	
	(i) $V \propto I$	1	
	(ii) at 2.5 V , Current will be 0.25 A	1	2
24.			
	Correct Diagram and Labelling	½ +1½	
	OR		
			
	Diagram Process – Budding	1 1	2
25.	• Safranin is used to stain/colour the material for better view.	1	

	• Glycerine prevents the leaf peel from getting it dried.	1	2
26.	The solution turns i. green to colourless ii. black coating is formed on Zinc. Reason: Zinc is more reactive than iron so it displaces the iron from its salt solution.	 ½ + ½ 1	 2
27.	• 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. OR (i) Sodium hydrogen carbonate ($NaHCO_3$) or Sodium Carbonate (Na_2CO_3) (ii) $2CH_3COOH + Na_2CO_3 \rightarrow 2\ CH_3COONa + H_2O + CO_2$ or $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + H_2O + CO_2$ (iii) Liberated CO_2 is passed through lime water, which is turned to milky.	2 ½ 1 ½	 2