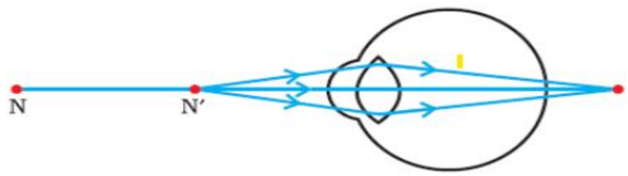
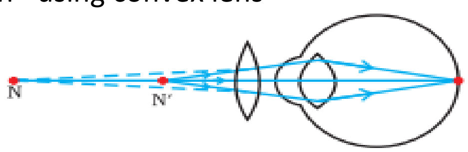
COMMON PRE-BOARD EXAMINATION 2022-23

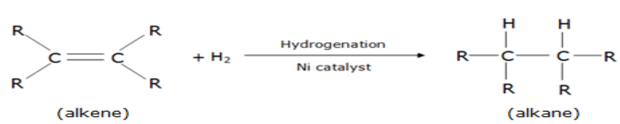
Subject: (Science -086)

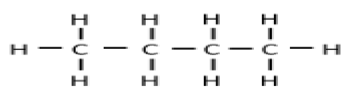
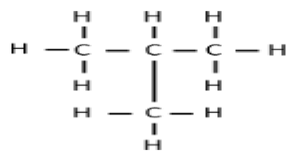
MARKING SCHEME

SECTION – A			
1	(a) Hydrogen gas and iron chloride are produced.	1	1
2	(b) Oxidised-H_2, Reduced-CuO	1	1
3	(b) Test tube B	1	1
4	(d) Hydrochloric acid	1	1
5	(c) (ii)only	1	1
6	(a)16 ml	1	1
7	(c) both (A) and (D)	1	1
8	(a) Only in Lungs	1	1
9	(c) Geotropism	1	1
10	(c) Jasmine by layering and Rose by cutting	1	1
11	(b) girl	1	1
12	(c) 1 : 1	1	1
13	(b) $R_2 < R_1$	1	1
14	(c) 2A	1	1
15	(a) Forces both pointing into the plane of paper	1	1
16	(b) Switches, fuses and circuit breakers should be placed in the neutral wire.	1	1
17	(a)Both A and R are true and R is the correct explanation of assertion.	1	1
18	(iv)A is false but R is true	1	1
19	(iii)A is true but R is false (because pea plant has bisexual flowers and are self-pollinated.)	1	1
20	(a) Both (A) and (R) are true and R is the correct explanation of the assertion.	1	1
SECTION – B			
21	Nitric acid is a strong oxidising agent. It oxidises hydrogen to water and itself will get reduced to any of the nitrogen oxides(N_2O, NO_2,NO) OR Calcium reacts with water to release hydrogen gas. These hydrogen gas bubbles stick to the surface of calcium metal pieces and calcium starts floating in water. $Ca_{(s)} + 2H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)} + H_{2(g)}$	1 1 1 1	2
22	The length of the small intestine differs in various animals depending on the food they eat. Herbivores eating grass need a longer small intestine	1+1	2

	to allow the cellulose to be digested. Meat is easier to digest, hence carnivores like tigers have a shorter small intestine.		
23	i. Plasma ii. Haemoglobin present in RBCs	1+ 1 =2	2
24	Sheetal's action voluntary because rushing out to the kitchen was a **conscious controlled or voluntary**. The smoke and smell were perceived by specific **receptors i**n the sense organs and signals are sent to the **brain**, from where signals are sent to the **effectors**. (Any relevant or logical explanation)	½ mark for each term used ½ + ½ + ½ + ½ = 2	2
25	Hypermetropia/ Long-sightedness  Correction –using convex lens  	1 (1/2) (1/2)	2
26	A food chain shows us how every living organism is dependent on other organisms for survival. Explains the path of energy flow within the ecosystem	1+1	2
	SECTION - C Q.no. 27 to 33 are short answer questions.		
27	(a) $2Pb(NO_3)_2(s) \xrightarrow{Heat} 2PbO(s) + 4NO_2(g) + O_2(g)$ (Lead nitrate) (Lead oxide) (Nitrogen dioxide) (Oxygen) (b) Nitrogen dioxide (c)Thermal decomposition reaction	1 1 1	3
28	(a) $2Cu_2S + 3O_2(g) \xrightarrow{Heat} 2Cu_2O(s) + 2SO_2(g)$ $2Cu_2O + Cu_2S \xrightarrow{Heat} 6Cu(s) + SO_2(g)$ Copper is obtained from the sulphide ore by heating in sufficient supply of air. (b) Anode -the impure metal M Cathode -a thin strip of pure metal M.	(1+1) (1/2 + ½)	3
29	Ans. i. Many plant waste products are stored in cellular vacuoles of mesophyll and epidermal cells. Waste products may be stored in leaves that fall off.	1 + 1 + 1 = 3	3

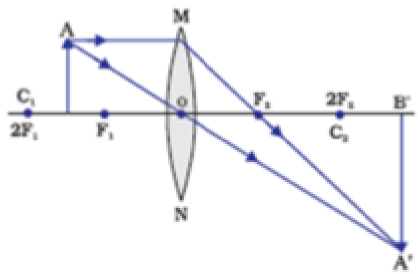
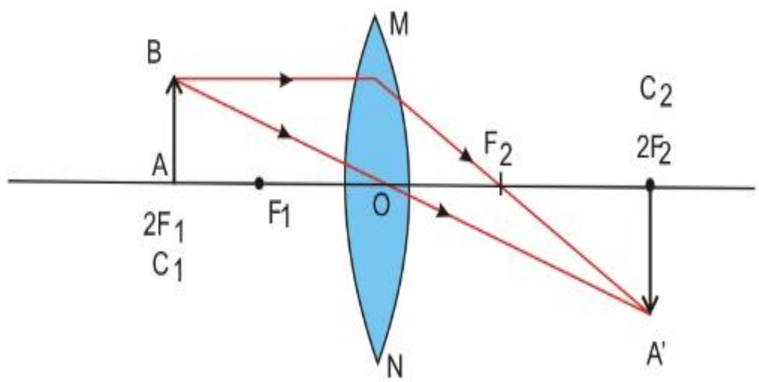
	ii. Gaseous wastes like oxygen, carbon-dioxide are removed through stomata in the leaves. iii. excess of water in the removed in the form of water vapour is also excreted from the stomatal pores by the process of transpiration OR i) Respiratory rate in aquatic organisms is higher than in terrestrial organisms. As they have to take oxygen dissolved in water and this is less compared to atmospheric oxygen. ii)Capillaries are the thinnest blood vessels as they are the blood vessels present in cells and help in exchange of materials at cellular level. iii) Trachea does not collapse when there is no air in it as it has rings of cartilage around it.	1 + 1 + 1 = 3	
30	i. Figure B represents the correct pattern of field lines. ii. In figure A, field lines cross each other which is not possible because if they cross each other, at the point of intersection, there would be two directions of field lines. iii. As per the figure, lines of the forces originating from poles, hence the poles of magnet facing each other are north poles.	1 1 1	3
31	a. Absolute refractive index of a medium is defined as the ratio of the speed of light in vacuum or air to the speed of light in the medium. It is denoted by n. n=speed of light in air/vacuum (c) / speed of light in medium (v) n=c/v b. Given, Speed of light in air,c=3×10^8 m/s Speed of light in medium,v=2×10^8 m/s n=c/v =$3\times10^8/2\times10^8$ =1.5	1 1 ½ ½	3
32	(a)i. Solar furnace- Concave mirror ii.Rear view mirror- Convex mirror (b) Nature of the mirror- Concave mirror(0.5 mark) $m = -\frac{1}{5} = \frac{-(-18)}{u}$ gives $u = -90$ cm (0.5 mark) use $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ (0.5 mark) $\frac{1}{f} = \frac{1}{-18} + \frac{1}{-90}$ gives $f = -15$cm (0.5 mark) OR	½ ½ ½ ½ ½ ½ ½	3

	Power of lens = Ability to converge/ diverge light rays passing through it/ reciprocal of the focal length in metres / $\frac{1}{f}(in\ meters)$ (0.5 mark) SI unit of power is Dioptre(0.5 mark) Power of 1st lens $P_1 = \frac{100}{f1} = \frac{100}{40\ cm}$ = +2.5 D (0.5 mark) Nature: Converging lens/ Convex lens (0.5 mark) Power of 2nd lens $P_2 = \frac{100}{f2} = \frac{100}{-20\ cm}$ = -5 D (0.5 mark) Nature: Diverging lens/ concave lens (0.5 mark)	½ ½ ½ ½ ½	
33	i)Formation of ozone occurs as follows: $O_{2(g)} \xrightarrow{UV} O_{(g)} + O_{(g)}$ $O_{2(g)} + O_{(g)} \xleftrightarrow{UV} O_{3(g)}$ ii)Any two ways of disposal-recycling /reusing	2+ ½ + ½ = 3	3
	SECTION - D		
34	a)C_3H_6 is an alkene which is unsaturated and C_4H_{10} is an alkane, which is saturated. Hence, C_3H_6 is more likely to undergo an addition reaction.  b)i)CH3-CH2-CH2-COOH Functional group- COOH ii)CH3-CH2-CH2-CH2-Br Functional group- Br	(1+1) 1(1/2 equation+ ½ catalyst) 1 1	5
	OR a) (i) Calcium hydroxide solution in test tube B will become milky due to the formation of calcium carbonate. (ii) Reaction in test tube A: $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2 + H_2O$	1 1 1	

	(iii) If ethanol is given instead of ethanoic acid, similar changes won't be observed because ethanol does not react with sodium hydrogen carbonate. b) When two or more organic compounds have the same molecular formula but different structural formula, then the compounds are called isomers, and this phenomenon is called isomerism.   Butane C_4H_{10} Iso-Butane C_4H_{10}	1 1	
35	(a) A – Ureter B – Seminal vesicle C – Urethra D – Vas deferens (b) Testes produce male sex hormone testosterone. Hormone Testosterone brings about the development of secondary sexual characters during puberty in boys like growth of facial hair, deepening of voice, build-up of muscle mass and also regulates formation of sperms. (c) Seminal vesicles (B) release its contents into the ejaculatory duct during ejaculation. Urethra (C) carries sperms from the vas deferens through the penis. **OR** a) The given diagram is the sectional view of human female reproductive system. The labelled parts are: 1. Funnel of fallopian tube or oviduct 2. Ovary 3. Uterus or womb 4. Cervix 5. Vagina (b) Contraception is the avoidance of pregnancy. There are several methods of contraception such as: • Barrier methods (condoms, diaphragm, etc.) • Chemical methods (spermicide creams and jellies)	½ X 4 = 2 1+1 ½ + ½ = 5 marks ½ X 5 = 2 ½ 1	5

	• Intrauterine Contraceptive Devices (IUCDs) (Lippes loop, CuT, etc.) • Natural methods (rhythm method, coitus interruptus) Surgical methods (vasectomy, tubectomy) Three advantages of adopting contraceptive methods are: • They prevent frequent or unwanted pregnancies. • They prevent the transfer of sexually transmitted diseases (STDs). They help to regulate the population growth.	½ X 3= 1 ½ = 5 marks	
36	(a) Given: $R_1 = 10\ \Omega$; $R_2 = 20\ \Omega$; $R_3 = 30\ \Omega$ According to Ohm's law, $V = IR$ Given $V = 12$ V i. Current through resistor R_1 : $I_1 = \frac{V}{R_1} = \frac{12}{10} = 1.2$ A Current through resistor R_2 : $I_2 = \frac{V}{R_2} = \frac{12}{20} = 0.6$ A Current through resistor R_3 : $I_3 = \frac{V}{R_3} = \frac{12}{30} = 0.4$ A (0.5+0.5+0.5) ii. Total circuit resistance, R $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ (0.5 mark) $\frac{1}{R} = \frac{1}{10} + \frac{1}{20} + \frac{1}{30}$ $\frac{1}{R} = \frac{11}{60}$ $R = \frac{60}{11} = 5.45\ \Omega$ (0.5 mark) iii.	1 ½ ½ ½ ½	5

	The total current in the circuit is $I = I_1 + I_2 + I_3$ $= 1.2 + 0.6 + 0.4 = 2.2$ A (0.5 mark) (b) ⇒ 1 / Rp = 1 / R + 1 / R + 1/ R + 1 /R (0.5 mark) ⇒ 1 / Rp = 4 / R ⇒ Rp = R / 4 (0.5 mark) ⇒ Rp = 20 / 4 (0.5 mark) ⇒ Rp = 5 Ω (0.5 mark)	4x½	
	SECTION - E		
37	(i) T (ii) (R<P<S<Q<T) (iii) Metals which are more reactive than Zinc can displace zinc from its salt solution. Therefore, Magnesium can displace Zinc from its salt solution OR The blue colour of the copper sulphate will change to green. There will be reddish brown deposit on iron nails. $Fe(s) + CuSO_4(aq) \rightarrow FeSO_4(aq) + Cu(s)$ (Copper sulphate) (Iron sulphate)	1 1 2 1 1	4
38	(i) Substances that are not broken-down biological processes are said to be non-biodegradable (ii) Changes in packaging have resulted in much of our waste becoming non-biodegradable (iii) Any two biodegradable and two biodegradable substances. **OR** Any two differences between biodegradable and non-biodegradable substances	1 1 ½ + ½ + ½ + ½ = 2	4
39	i. At 2f,Image distance= object distance From the table,2f= 30cm f=30/2= 15cm (1 mark) ii.5th observation is incorrect (image should form at infinity as the object is placed at focus(15cm) (1 mark) iii. Rays no. 2, 3 and 4 follow the laws of refraction of light. (1 mark)	1 1 1	4

	 (1 mark) • This ray diagram is drawn using ray no. 2 and 3. (A candidate can select any two correct rays out of the three. He should use two chosen rays while drawing the ray diagram.) OR i. m = – 1, means that the Image is real, inverted and of the same size as the object) ∴ Object distance =image distance= 2f = 25 cm (1 mark)  (1 mark)	1 1 1	