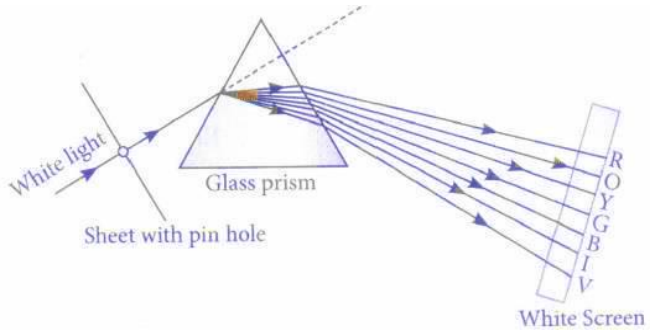
COMMON PRE-BOARD EXAMINATION 2022-23

SCIENCE -086

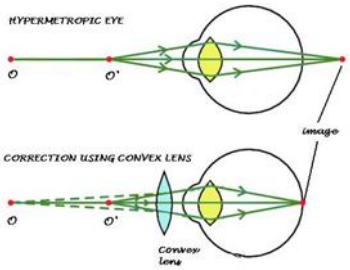
Class: X

MARKING SCHEME – Answer Key

	SECTION – A	
1	(d) ii and iv	1
2	(a) Option A	1
3	(d) Silver nitrate and potassium chloride undergo double displacement reaction to form silver chloride and potassium nitrate	1
4	(a) yellow residue of PbO	1
5	(b) Potassium	1
6	(a) Water < Acetic acid < Hydrochloric acid	1
7	(c) 16 covalent bonds	1
8	(a) To show that chlorophyll is necessary for photosynthesis	1
9	(c) Holozoic nutrition	1
10	(b) YR, yR, Yr, yr	1
11	(a) olfactory receptors → dendritic tip of a nerve cell → axon → nerve ending → release of signal dendritic tip of other nerve cell.	1
12	(c) the cells around the cut start to divide to form a complete organism.	1
13	(c) Resistance will become half.	1
14	(c) Red, black, green.	1
15	(d) Variable resistance	1
16	(b) the current will change its direction continuously.	1
17	(a) Both A and R are true, and R is correct explanation of the A	1
18	(a) Both A and R are true and R is the correct explanation of A	1
19	(b) Both A and R are true and R is not the correct explanation of A	1
20	(a) Both A and R are true, and R is correct explanation of the A	1
	SECTION – B	
21	Hydrogen gas (½ mark) $Zn + 2HCl \longrightarrow ZnCl_2 + H_2$ (1 mark)	2

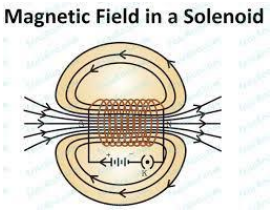
	When a burning splint is brought near the mouth of the test tube, the gas burns with a pop sound. (½ mark) **OR** (a) Chemical formula – $CaOCl_2$ (½ mark) Chemical name – Calcium oxychloride (½ mark) (b) $CaOCl_{2(s)} + CO_{2(g)} \longrightarrow CaCO_{3(s)} + Cl_{2(g)}$ (1 mark)	
22	Pancreas are known to have a dual function because it acts as both an endocrine gland and exocrine gland i.e. it is a part of both the hormonal and digestive system of the body respectively. (1 ½ mark) It secretes hormones insulin and glucagon as well as digestive enzymes. (½ mark)	2
23	Intestinal villi are tiny, finger-like projections made up of cells that line the entire length of the small intestine. The villi (villus is singular and villi are plural) absorb nutrients from the food we eat and then shuttle those nutrients into the bloodstream so that they can be sent where they are needed. (1 mark) If one doesn't have functioning intestinal villi, they can become malnourished or even starve, regardless of how much food they eat, because the body simply isn't able to absorb and make use of that food. (1 mark)	2
24	An artificial kidney is a dialysis machine. When both the kidneys become fail to work the dialysis machine is used out. The patient's blood is led from the radial artery in his arm through the machine where the urea and excess salts are removed and the purified blood is returned to a vein in same arm. (2 marks)	2
25	The process of splitting of white light into its 7 constituent colours is called Dispersion. (1mark)  (1 mark) OR Actual sunrise is actual crossing of the horizon by the Sun. From two minutes well before the actual sunrise, the rays of sun entering the atmosphere of earth undergoes refraction and reach the eye of the observer. So Sun becomes visible at an apparent position with respect to the horizon before actual sun rise. (2 mark)	2

26	Decomposers break down the complex organic substances of garbage, dead animals and plants into simpler inorganic substances that enter into the soil and are used up again by the plants. In the absence of decomposers, recycling of material in the biosphere will not take place which will ultimately lead of all life forms. (2 marks)	2
	SECTION – C	
27	(a) Single displacement reaction- More reactive aluminium displaces iron from ferric oxide and forms aluminium oxide. It is also an oxidation reaction. (½ + ½) - 1 mark (b) Double displacement reaction – Exchange of ions between potassium iodide and lead nitrate and forms lead iodide and potassium nitrate. (½ + ½) - 1 mark (c)Thermal Decomposition reaction – In the presence of heat zinc carbonate decomposes to form zinc oxide and carbon dioxide. (½ + ½) - 1 mark	3
28	(a) (i) Acidic salt -$CaCl_2$ (ii) Basic salt- K_2CO_3 (iii) Neutral salt – NaCl, Na_2SO_4 (½ + ½ + ½ + ½ - 2 mark) (ii) Washing soda – Na_2CO_3 . 10 H_2O (½ + ½ - 1 mark)	3
29	Fishes have only two chambers in their heart, the blood is pumped to the gills to get oxygenated blood and from there it passes directly to rest of the body. Thus, the blood goes only once through the heart during one cycle of passage through the body. (1 ½ mark) In human beings, during circulation blood travels twice through the heart in one complete cycle of the body and is called double circulation. The pathway of blood from the heart to the lungs and back to the heart is called pulmonary circulation and the pathway of blood from the heart to the rest of the body and back to heart is called systemic circulation. (1 ½ mark)	3
30	Magnification is the ratio of size of the image to the size of the object (1 mark) m = $\frac{h'}{h}$ u = -20cm v = -40cm f =? $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ (1 mark) substituting u and v f= 13.33cm m = - $\frac{-40}{-20}$ = -2 (1mark)	3
31	(a) (i) Shortening of eye ball. (ii) Focal length of crystalline lens is too long. ($\frac{1}{2}$ mark x 2 =1)	3

	(b)  (1 mark x 2= 2)	
32	(a) The deflection in the compass needle increases. The Magnetic field of the current carrying conductor is directly proportional to the current flowing through it. (b) The deflection in the needle decreases as the magnetic field is inversely proportional to the perpendicular distance from the wire. ($1\frac{1}{2}$ mark x 2 =3) 0R The displacement of the rod AB will be affected in the following ways (a) If the current in the rod is increased, then the force in the rod will also increase. Then the rod will be deflected with greater force as the greater force leads to an increase in displacement. (b) If a stronger horse-shoe magnet is used, then also rod will be deflected with greater force due to the increase in the magnetic field. (c) If the length of the rod AB is increased, then the force exerted on the current-carrying conductor will also increase. (1mark x 3 =3)	3
33	(a) This food web has five interconnected food chains. (1 mark) (b) Characteristics of the interaction in the given food web are: (i) Unlike food chains, food webs are never straight. Instead, each food web is formed by interlinking of food chains. (ii) A food web provides alternative pathways of food availability. (2marks)	3
	SECTION – D	
34	(a) (i) $CH_3CH_2OH + O_2 \longrightarrow CO_2 + O_2$ + heat + light (1 mark) (ii) $CH_3CH_2OH \xrightarrow[443\ K]{H_2SO_4} CH_2{=}\ CH_2 + H_2O$ Ethanol Ethene (1 mark) (iii) $2\ Na + 2\ CH_3CH_2OH \longrightarrow 2\ CH_3CH_2ONa + H_2$ (1 mark) (b) Alkaline $KMnO_4$, Acidified $K_2Cr_2O_7$ (½ + ½ = 1)	5

		Litmus test
	Ethanol	No change
	Ethanoic acid	Blue litmus changes to red

(1 mark)

35	In a germinating seed, plumule in known as future shoot and ridicule is known as future root. The function of cotyledon is to store food for the future plant or embryo. (2marks) Asexual reproduction does not involve genetic fusion while sexual reproduction involves fusion of male and female gametes to form a zygote. (1 mark) Species reproducing sexually have better chances of survival. This is because sexual reproduction gives rise to more variations which are essential for evolution as well as for the survival of species under unfavourable conditions. (2 marks) **OR** Meiosis is a way of cell division in which a number of chromosomes get halved. After fertilization chromosomes become equal to that of somatic cells. After fertilization Mitosis takes place for the rest of the stages of life. Hence chromosomes remain constant. (3 marks) Following changes occur in the uterus if fertilization does not occur Extra lining of Uterus degenerates Uterus lining fragments gets discharged through vagina Unfertilized egg gets discharged Menstruation takes place (½ + ½ +½ + ½ = 2 marks)	5
36	(a) A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid. The magnetic field lines around a current carrying solenoid is similar to a bar magnet. One end of the solenoid acts as north pole, while the other behaves as the south pole. The field lines inside the solenoid are parallel straight lines. (2mark)  (1 mark) (b) A solenoid can be converted to an electromagnet by inserting a soft iron core into it. Strength of the electromagnets depends on amount of current flowing through it, number of turns in the solenoid, nature of the core. (1-mark x 2 =2)	5
	SECTION – D	
37	(a) $Fe + O_2 + H_2O \longrightarrow Fe_2O_3 . x H_2O$ (1 mark)	4

	(b) Buildings and bridges can collapse, oil pipelines break, chemical plants leak, leads to wastage of tonnes of iron every year and lot of money is spent to repair it. (any other relevant point) (any one point - 1 mark) (c) Galvanization (1 mark) Alloying/ painting / oiling / greasing / chromium plating (any two ½ mark each) - (1 mark) **OR** (d) C - Iron hinges on a gate Iron is in contact with both atmospheric oxygen and moisture/ water vapour. (2 mark)	
38	(a) Dwarf and wrinkled seed. (height of plant) (any two ½ mark each) – (1 mark) (b) 1:2:1 (1 mark) (c) When a tall plant (TT) is crossed with a short tea plant (tt), only tall plants are obtained in F1 progeny. It is because out of two contrasting traits only one appears in the progeny of first generation. This means that the trait which appears in F1 generation is dominant and the trait which does not express is recessive. The character TT for tall plant is dominant, so all the plants are tall. (2 marks) **OR.** (d) Phenotype of F1 progeny is Round Yellow The given cross was made between pure breeding pea plants, one with round and green seeds and the other with wrinkled and yellow seeds. (1mark) Yellow seed colour and round seed shape is dominant over green seed colour and wrinkled seed shape. In F1 generation, dominant traits express itself, whereas recessive traits get suppressed. (1 mark)	4
39	(a) Refractive index n = $\frac{C}{V}$ C is the speed of light in air or vacuum, v is the speed of light in the medium (1 mark) (b) n = $\frac{C}{V}$ v = $\frac{c}{n}$ 3 x 10^8/ 1.5 = 2 x 10^8 (1 mark) (c) Air – 1.0003, Diamond – 2.42 (1/2 mark x 4=2) OR (d) (i) Water and Kerosene. Kerosene is optically denser than water but massively rarer than water. (ii) Speed of light is inversely proportional to refractive index. (1mark x 2=2)	4