Indian School Al Wadi Al Kabir

Midterm Examination

Class: X | Sub: Science (086) | Max. Marks: 80

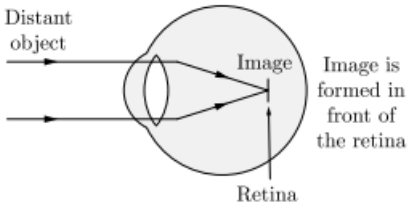
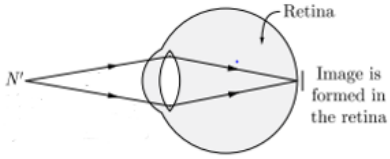
Date: 17/09/2024 | Set - II | Time: 3 hours

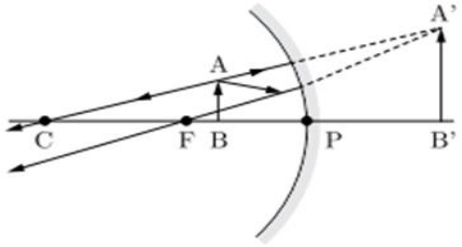
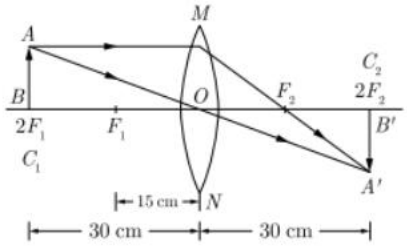
Marking scheme

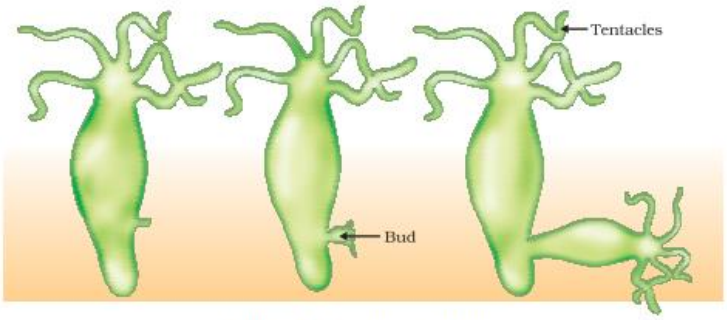
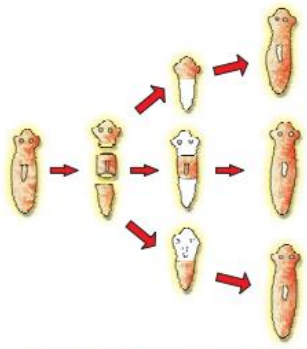
Q. No.	Answers	Marks distribution	Total
	MCQ		
1.	(c)The chemical composition of the reactants is the same before and after the reaction.	1	1
2.	(c) Mg, CuSO4, $MgSO_4$	1	1
3.	(c) (i) and (ii) only	1	1
4.	(d)NaCl, $NaHCO_3$,Na_2CO_3	1	1
5.	(c) A strong acid and a weak base	1	1
6.	(a) H_3O+ and Cl^-	1	1
7.	(d)Is exothermic and pH of the solution formed is more than 7	1	1
8.	(d) Fig. D	1	1
9.	(b) contract and lens become thicker	1	1
10.	c) Digestion of fats, Digestion of proteins	1	1
11.	d) all of these	1	1
12.	(c) energy and starch	1	1
13.	(c) CFCs; Ozone	1	1
14.	(c) primary consumer to secondary consumer	1	1
15.	b. Malaria parasite	1	1
16.	(c) this eliminates the need of producing plant using seeds	1	1
	Assertion (A) and Reason (R)		
17.	(b) Both A and R are true but R is not the correct explanation of A	1	1
18.	(d) Assertion is false but Reason is true.	1	1
19.	(a) Both A and R are true, and R is the correct explanation of the assertion.	1	1
20.	(d) Assertion is false but Reason is true.	1	1
	TWO MARKS		
21.	$2H_2O \rightarrow 2H_2(g) + O_2$ $2AgBr\ (sunlight) \rightarrow 2Ag + Br_2$	1 1	2

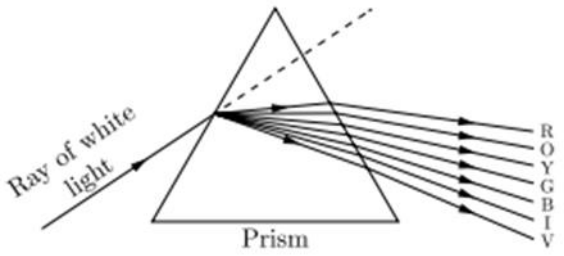
22.	Absolute refractive index of a medium is defined as the ratio of speed of light in vacuum or air to the speed of light in the medium. It is denoted by n. $n = \frac{\text{Speed of light in air}}{\text{Speed of light in medium}} = \frac{c}{v}$ i)Bends away from the normal ii)Bends towards the normal OR The radius of curvature is the radius of the sphere from which the spherical mirror forms a part. Since R= +30cm f=R/2= +30/2=+15cm Nature of the mirror= convex mirror	½ ½ ½+½ 1 ½+½	2
23.	If the earth had no atmosphere consisting of air, there would have been no scattering of sunlight at all. In that case no light from the sky would have entered our eyes and the sky would have looked dark and black to us.	2	2
24.	B The small intestine is longer in herbivores than in carnivores because herbivores consume plant and grass-based food which is high in cellulose and the digestion of cellulose takes a long time. The length of the small intestine differs in various animals depending on the food that they eat.	½ 1½	2
25.	a) Each nephron is made up of a very small filter, called a glomerulus, which is attached to a tubule. As blood passes through the nephron, fluid and waste products are filtered out. Extra fluid is then returned to the blood, while the waste products are concentrated in any extra fluid as urine b) The amount of water reabsorbed by nephron depends on two major factors: (i) The amount of excess water present in the body. (ii) The amount of dissolved waste to be excreted out of the body.	1 ½+ ½	2
26.	According to the 10 percent law, only 10% of the energy is transferred to each trophic level from its lower trophic level. If 10,000 joules of energy is available to the producer, then only 1000 joules of energy will be available to the primary consumer and only 100 joules of energy will be available to the secondary consumer. The energy available with the tertiary consumer will be 10 joules of energy. OR i)The food chain connecting grass, mice, and eagle will be the one in which the eagle receives the maximum proportion of energy from producers. ii) The organism that will be mostly affected when a non-biodegradable pesticide is introduced into the soil is the Eagle. This phenomenon is called as Biomagnification.	1+1	2

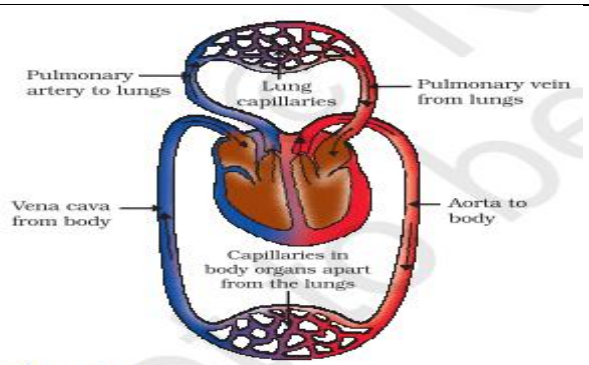
	3 MARKS		
27.	(i) it turns milky due to the formation of insoluble calcium carbonate(1/2m) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$(1 mark) (ii)If CO2 is passed for long duration through lime water, the white precipitate formed dissolves due to the formation of soluble calcium hydrogen carbonate and the solution becomes clear. (1/2 m) $CaCO_3+H_2O+CO_2 \rightarrow Ca(HCO_3)_2$(aq) (1 m) OR (a) Plaster of Paris. (a) Plaster of Paris. (b) $CaSO_4.2H_2O$ (373K)→$CaSO_4.1/2\ H_2O$ +3/2 H_2O (c) It is used in hospitals for fixing fractures, supporting the bones in the right position. (1+1+1)	½ + 1 + ½ + 1 1+1+1	3
28.	Amphoteric oxide is an oxide that reacts with both acids and bases to form salt and water. In other words, it possesses both acidic and basic properties. (1 mark) ZnO and Al_2O_3 (1/2 +1/2) $Al_2O_3+6HCl \rightarrow 2AlCl_3+3H_2O$ $Al_2O_3+2NaOH+\rightarrow 2NaAl\ O_2 + H_2O$	½ + ½ 1 1	3
29.	(a) The ratio of the size of the image to the size of the object is called as magnification. $m = \frac{h_i}{h_o}$ Given, $u = -2\ \text{m}$ $\frac{1}{4} = \frac{v}{u}$ $\frac{1}{4} = \frac{v}{-2}$ $u = -\frac{1}{2}\ \text{m} = -0.5\ \text{m}$ $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\left(-\frac{1}{0.5}\right) - \left(\frac{1}{-2}\right) = \frac{1}{f}$ $\frac{1}{f} = -\frac{3}{2}$ $f = \left(-\frac{2}{3}\right)\text{m}$ Lens is concave.	1 1 1½ ½	3
30.	(a) This is due to the phenomenon of refraction of light. A ray of light starting from the lemon kept in water reaches the water-air interface and bends away from normal. To the observer, it appears as the light ray is coming from the point above the actual point. This apparent position makes them appear bigger in size. (b) The light ray will travel fastest in medium A because it is the medium with least refractive index. (c)	1 1 1	3

	$n_{aw} = \frac{1}{n_{wa}} = \frac{1}{1.33} = 0.75$		
31.	a) Myopia Elongation of the eyeball Excessive curvature of the eye lens (Any one cause) b) (i) back seat  (ii) front seat.  	½ + ½ 1 1	3
32.	a) Tracheid and vessels are two water conducting hollow tubes present in the vascular tissue called xylem. Xylem in a plant is responsible for transporting water from the roots to other parts of the plant. Water enters continuously into the root xylem by transpiration and the pressure gradient which is formed in the roots of the plant. Transportation of water from the leaves makes a transpiration pull in there which causes the roots to take out water from the ground in order to fill up the vacancy caused. b) Plants do not need to move from one place to another. Movements in a plant are usually at the cellular level and hence a far less amount of energy is required by plants. Animals, on the other hand, need to move from one place to another: in search of food. So, the energy need of animals is higher than of plants. c) Transpiration is the process during which water is lost in the form of water vapor from the internal tissues of the plants. Translocation is the movement of substances such as water, mineral nutrients.	1+1+1	3
33.	(a) Upon inhalation, the diaphragm contracts and flattens and the chest cavity enlarges. This contraction creates a vacuum, which pulls air into the lungs. . (b) The cartilage rings are present in the trachea to prevent it from collapsing. This enables the lumen of the trachea to stay open during breathing. (c)Release of CO2., lime water turns milky white, formation of calcium carbonate	1+1+1	
	5 MARKS		
34.	(i)$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$ (1Mark) Displacement reaction (1/2 mark) Define ((1Mark) (i) $2Pb(NO_3)_2(s) \Delta \rightarrow 2PbO(s) + 4NO_2(g) + O_2(g)$ (1 mark) Thermal decomposition reaction (1/2 mark) Define (1 mark)	1 + ½ + 1 1 + ½ + 1	5

	OR (i) (a) 2 $Cu(NO_3)_2$ (s) + Heat → 2 CuO (s) + 4 NO_2 (g) + O_2 (g) (1 mark) (b) The brown gas is of nitrogen dioxide. (1 mark) (c) NO_2 gas reacts with water to produce nitric acid. Thus, its pH range will be less than 7. (1 mark) (ii) $FeSO_4$ (s) + Heat → Fe_2O_3 (s) + SO_2 (g) + SO_3 (g) (1 mark) It is a thermal decomposition reaction. (1mark)	1+ 1 + 1 + 1 + 1	5
35.	(a) In case I, image is formed between F and C. It is real, inverted, and smaller in size. (b) In Case II, since, the object is placed at centre of curvature. (c) Dentists use concave mirrors to see teeth and other areas in the mouth. This is because a concave mirror forms a virtual, erect and enlarged image when the object is placed within focus. (d) Case III can be used as shaving mirror because, when object is placed between P and F, we get virtual, erect and magnified image.  **OR** (i) For $u = -60\,\text{cm}$; $v = 20\,\text{cm}$ $\frac{1}{f} = \frac{1}{20} + \frac{1}{60}$ $\left(\text{Using } \frac{1}{f} = \frac{1}{v} - \frac{1}{u}\right)$ $= \frac{3+1}{60}$ $= \frac{4}{60} = \frac{1}{15}$ or $f = 15\,\text{cm}$ Focal length of the convex lens $= 15\,\text{cm}$ (b) The set u = 12 cm and v = 70 cm is incorrect as in all other sets, we get f = 15 cm by using the given values of u and v but in this set, the value of f is different. (c) Ray diagram for the third set where u = 30 cm , v = 30 cm :  (d) Uses of convex lens are: 1) Convex lens is used in microscopes and magnifying glasses to subject all the light to a specific point. 2) Convex lens is used as a camera lens in cameras. 3) Convex lens is used in the correction of hypermetropia. (any two)	1 1 1 1 1 1 1 1 2 1	5 5

36.	a) In amoeba, splitting of the cell into two during cell division can take place in any plane. Leishmania has a whip like structure at one end of the cell, hence binary fission occurs in a definite orientation in relation to this structure. b)  **Figure 8.4** *Budding in Hydra* c) The sporangia (singular sporangium) are the structures which contain spores of Rhizopus. These spores can develop into new individuals under favorable conditions. Moisture Optimum temperature, Oxygen, Nutrients OR Regeneration is the process by which some organisms replace or restore lost or amputated body parts.  **Figure 8.3** *Regeneration in Planaria* . b)Vegetative propagation is a process in which plants reproduce from stems, roots and leaves. It is a form of asexual reproduction seen in plants ii)It is useful for propagating those plants that do not produce viable seeds or produce a smaller number of seeds. Another advantage of vegetative propagation is that all plants produced are genetically similar enough to the parent plant to have all its characteristics. c) Vegetative propagation, buds produced in the notches along the leaf margin of Bryophyllum fall on the soil and develop into new plants	2 2 1 2 2 1	5 5
	CASE STUDY		

37.	(i)X=Cl_2 , Y = H_2 (1/2 +1/2) (ii) $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$ (1 mark) (iii) (a) Z is a base (1 mark) (b) When methyl orange is added to substance Z, that is NaOH, it changes its colour to yellow. (1 mark) **OR** (a) Concentrated aqueous solution of sodium chloride. (b) $NaHCO_3$, $CaOCl_2$ (1+1 mark)	½ + ½ 1 1+1 1+1	4
38.	(i) Rainbow (ii) Colour 'B' has higher speed than that of colour 'A'. factor speed of light depends- wavelength (iii) The splitting of white light into its seven constituent colours, if white light is passed through prism is called dispersion. Light rays of different colours (or different wavelengths) travel with different speeds in a refractive medium like glass. So each colour is refracted (or deviated) by a different angle with the result that seven colours are spread out to form a spectrum. OR  Figure: Dispersion of white light by a glass prism.	1 1 1+1 2	4
39.	a) i) Veins have valves to prevent the backflow of blood because the blood in veins flow. ii) pulmonary artery is the only artery which carries impure or deoxygenated blood b) The ventricles of the heart have thicker muscular walls than the atria. This is because blood is pumped out of the heart at greater pressure from these chambers compared to the atria.	 ½ ½ 1 1mark for diagram	4

	c)  **Figure 6.11** *Schematic representation of transport and exchange of oxygen and carbon dioxide* OR c) Amphibians or many reptiles have three-chambered hearts, Fishes, on the other hand, have only two chambers to their hearts. The separation of the right side and the left side of the heart is useful to keep oxygenated and deoxygenated blood from mixing. Such separation allows a highly efficient supply of oxygen to the body.	1mark for labelling ½ + ½ +1	