COMMON PRE-BOARD EXAMINATION 2023-24

Subject: SCIENCE (086)

Class X - SET C

MARKING SCHEME

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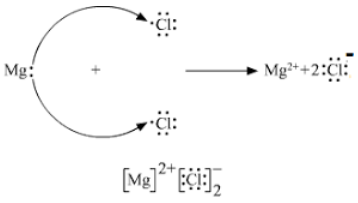
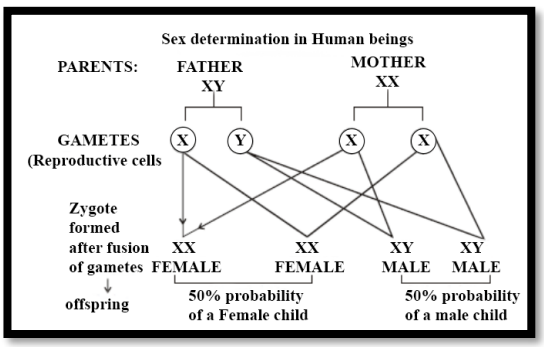
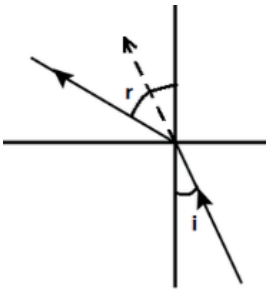
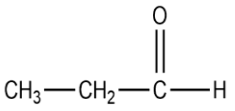
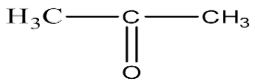
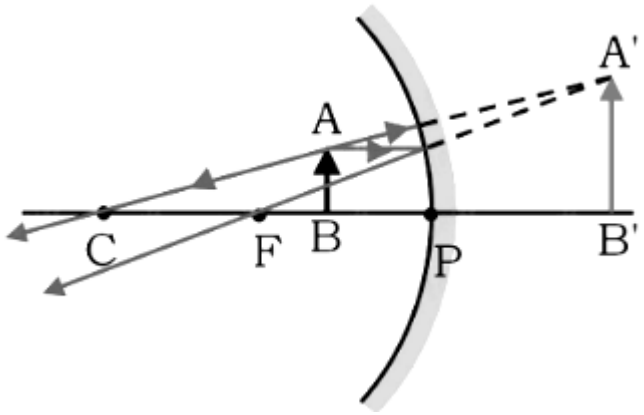
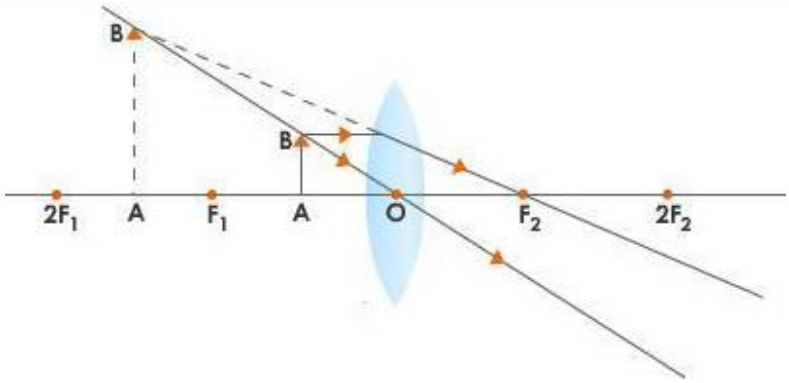
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
C	1.	(b) They are sonorous	1
C	2.	(d) Acidified $CuSO_4$ (aq)	1
C	3.	(c) Methanoic acid	1
C	4.	(d) Both (a) and (c)	1
C	5.	(b) (ii) and (iv)	1
C	6.	(c) Nitrogen and helium	1
C	7.	(c) lead and tin	1
C	8.	(c) Skin Cancer	1
C	9.	(a) 1	1
C	10.	(a) ovary	1
C	11.	(d) paper cups are biodegradable and eco-friendly	1
C	12.	(c)Chemotropism	1
C	13.	(d) behind the mirror	1
C	14.	(a) A and D	1
C	15.	(c) Cytokinin	1
C	16.	(b) Movement of water in and out of the guard cells	1

C	17.	a) Both A and R are true, and R is the correct explanation of A.	1
C	**18.**	(c) A is true but R is false.	1
C	**19.**	c) A is true but R is false	1
C	**20.**	a) Both A and R are true, and R is the correct explanation of A.	1
C	**21.**	A- Copper B- Copper oxide $2Cu + O_2 \rightarrow 2CuO$ $CuO + H_2 \xrightarrow{heat} Cu + H_2O$	½ x 4 = 2
C	**22.**	STDs caused by viral infection – warts(1) and HIV-AIDS(1)	2
C	**23.**	Arteries receive the blood pumped by heart with lots of pressure hence to tolerate and sustain this pressure they are thick walled and elastic.(1) Valves prevent the back flow of blood (1) **OR** Respiratory pigment – haemoglobin. (1) It is present in red blood cells and has affinity for O2 thus helping in its transport.(1)	2
C	**24.**	(a)Frequency of light remains the same when light goes from one medium to another medium. (b) Mirror A will form a diminished image of the object	1 1
C	**25.**	For first wire $R_1 = \rho l/A = 9\Omega$ for second wire $R_2 = \rho l/3/3A = 1/9\rho l/A$ $R_2 = 1/9\ R_1$ $R_2 = 1\Omega$ The resistance of the new wire is 1Ω. OR **The direction of force is perpendicular to the direction of magnetic field and current.** The direction of current is taken opposite to the direction of motion of electrons. **The force is therefore directed out of the page**. The direction of force is determined by Fleming's left hand rule. According to this rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of magnetic field and the second finger	½ ½ ½ ½ ½ ½ ½ ½

		in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.	
C	**26.**	200 J (1). 10% law - 10% energy is available to the next trophic level(1)	2
C	**27.**	(a) The process of coating zinc over iron is called galvanization. 1 (b)  1 Any two properties 1	
C	**28.**	(i) Nitric acid is a strong oxidising agent. When Al is dipped in nitric acid, aluminium oxide is formed on the metal, which prevents further reaction of Al. Due this reactivity of Al decreases. (ii) It is because hydrogen gas formed during the reaction of Mg with water sticks to the surface of metal. (iii) Sodium being a highly reactive metal reacts so vigorously with oxygen that it catches fire if kept open in air. To prevent from accidental fires, sodium is kept in kerosene oil. **OR** Metal is mercury ½ Ore is cinnabar (HgS) ½ $2HgS_{(s)} + 3O_{2(g)} \xrightarrow{heat} 2HgO_{(s)} + 2SO_{2(g)}$ Cinnabar $2HgO_{(s)} \xrightarrow{heat} 2Hg + O_{2(g)}$ Mercuric oxide Mercury Oxygen 2	3
C	**29.**	Sex determination flow chart / explanation  	3

		Women produce only one type of ovum (carrying X chromosome) and males produce two types of sperms (carrying either X or Y chromosome) in equal proportions. So the sex of a child is a matter of chance depending upon the type of sperm fertilising the ovum	
C	**30.**	When squirrel is in a scary situation then its nervous system stimulates the adrenal glands to secrete more adrenaline hormone into blood(1) This adrenaline hormone increases heartbeat, breathing rate/ blood flow into muscles (1) All these actions of adrenaline hormone produces a lot of energy in squirrel's body. In this way, squirrel prepares itself for fighting or running away action.(1)	3
C	**31.**	(a)Water is optically rarer medium as its refractive index is smaller than that of alcohol. When we compare the two media, the one with smaller refractive index is called the optically rarer medium than the other as the speed of light is greater in this medium. (b)  (c) A magnification of +1/3 indicates an erect and diminished image. Only a **convex** mirror produces such an image. Position of object: Between infinity and the pole.	½ ½ 1 ½ ½
C	**32.**	(a) When iron filings are placed in a magnetic field around a bar magnet, they behave like tiny magnets. The magnetic force experienced by these tiny magnets make them rotate and align themselves along the direction of field lines. (b) The physical quantity indicated by this arrangement is the magnetic field produced by the bar magnet. (c) Magnetic field lines never intersect, magnetic field lines are closed curves.	1 1 1
C	**33.**	(a) Wire A is thicker. For $R_a = R_b$ and $L_1 = L_2$ $\frac{\rho_a}{\rho_b} = \frac{A_a}{A_b}$ For $\rho_a > \rho_b$, $A_a > A_b$	½ ½

		(b) Tungsten is a strong metal and has high melting point. (ii) It emits light at high temperatures. $P = V^2/R$	½ ½ 1
C	**34.**	(a)  IUPAC name: Propanal ½ + ½  IUPAC name: Propanone ½ + ½ Such compounds with same molecular formula and different structures are called isomers. ½ (b) P: Sodium hydrogen carbonate (Baking soda) ½ Q: Sodium carbonate ½ R: Carbon dioxide ½ $2NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2$ (g) 1 **OR** (i) Explain cleansing action of soap and micelle formation (with diagram) 2 (ii) (a) In test tube Y. The hardness of water is due to dissolved calcium and magnesium salts in it. Detergents do not give insoluble components on reaction with these salts. Hence detergents are more effective than soaps in hard water and form more lather in hard water. 1½ (b)In test tube X. The calcium and magnesium salts present in hard water react with soap to form insoluble compounds called scum resulting in the decrease in the formation of lather. 1½	5
C	**35.**	a. Testis(1/2) secrete male hormone - testosterone. (1/2) Function : Formation of sperms/ Development of secondary sexual characters. (1) b. (i) fallopian tube/oviduct.(1) (ii) uterus.(1) c. Placenta is a special disc like tissue embedded in the mother's uterine wall and connected to the foetus/embryo. Placenta provides a large surface area for glucose and oxygen/ nutrients to pass from the mother's blood to the embryo/ foetus.(1) **OR** R – spinal cord (1/2) S- cerebellum(1/2) T- cerebrum(1/2)	5

		(a) Function - Cerebellum which controls posture, balance of body and accurate voluntary movements.(1) Pituitary (1/2) (b) (1) Auxin (1/2) (2) Abscisic acid(1/2)	
C	**36.**	(a)The object has to be placed at a distance between 0 - 40 cm. This is because image is erect for a converging mirror when the object is placed between F and P. (b)The image is bigger than the object. (c)  (d)Used as a shaving mirror used by dentists to get enlarged images of teeth. OR (a) A palmist uses a convex lens to see the magnified image of palm lines. The palmist will hold the lens where the palm is in between the focus and pole of the lens. (b)  (c)f = 15cm, u = -6cm	½ ½ 1 2 1 1 2 ½ ½

		1/v -1/u = 1/f 1/v = 1/15+ 1/-6 v = -10cm m = v/u = -10/-6 = 1.67 The image is on the same side of the lens as an object (palm) and it is virtually erect and magnified.	½ ½
C	**37.**	a)When alkaline $KMnO_4$ is added drop by drop into test tube containing propanol, its purple colour disappears as it oxidises propanol into propanoic acid. CH_3CH_2OH Alk $KMnO_4$ + Heat → CH_3COOH b) (i) Propanol (ii) Propanal OR Ethene. It burns with yellow sooty flame	2+2=4
C	**38.**	a) The flower expected in their F1 generation is purple. This is because trait of flowers bearing purple colour is dominant.(2) b) The percentage of purple flower pea plants in F2 generation : 75% and white flower pea plants: 25%(1+1) **OR** F2 generation - phenotypic ratio - 3:1 and genotypic ratio 1:2:1(1+1)	4
C	**39.**	(i) The potential difference, *V*, across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature remains the same. (ii) Resistivity will remain the same. (iii) (d)1Ω $(1/5 \text{ X } 5 = 1\ \Omega)$ OR Power will increase 9 times as $P\alpha V^2$	1 1 1+1 1+1