BANGALORE SAHODAYA SCHOOLS COMPLEX ASSOCIATION

PRE-BOARD EXAMINATION (2023-2024)

Marking Scheme (2023-24)

Class-X

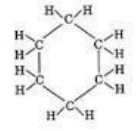
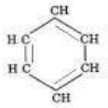
Science (Subject Code – 086)

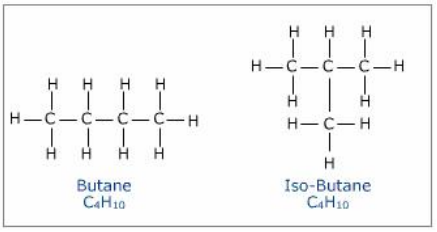
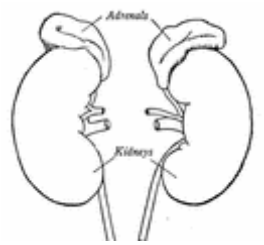
Set-1

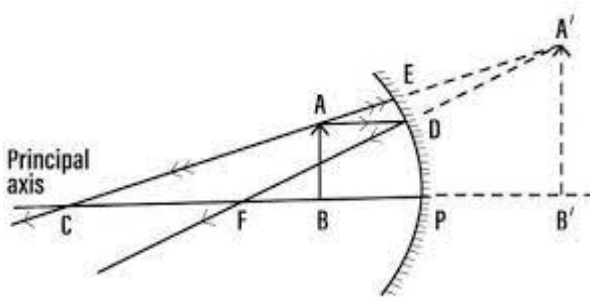
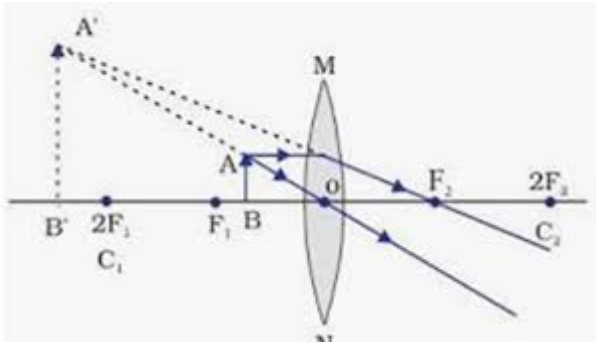
Q. No.	*Answer*	*Marks*
	Section–A	
1	c) Endothermic. Exothermic	1
2	c) $FeSO_4.7H_2O$, Fe_2O_3, SO_2, SO_3	1
3	b) Green	1
4	b) A, E, D, B, C	1
5	d) XY_3, Ionic	1
6	a) Na	1
7	b) CaO	1
8	a) Only 1	1
9	b) Insufficient production of insulin	1
10	c) Fertilisation cannot take place	1
11	c) Diffusion of auxin into cells that are in shade causes elongation of those cells	1
12	a) Sunlight is necessary for photosynthesis	1
13	c) Convex and magnification is -3	1
14	b) There is no atmosphere on the surface of the moon	1
15	d)10:1	1
16	c)An earthworm making a burrow in the soil	1
17	d) Assertion is false but Reason is true	1
18	c) A is true but R is false.	1
19	a) Both A and R are true and R is the correct explanation of A	1
20	a) Both A and R are true, and R is the correct explanation of A	1
	Section–B	
21	i) $Zn + HCl \rightarrow ZnCl_2 + H_2$/ $CaCO_3 + HCl \rightarrow CaCl_2 + H_2O + CO_2$ (any one reaction). [1] ii) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$ (any one reaction) [1]	2
22	i) B and E [0.5+0.5] Phenotype [0.5] ii) D has different characters from the parent /like dark eyes/knobs on the antennae/knobs on abdomen [0.5]	2
23	First circulation- Oxygenated blood from lungs come to left atrium,to left ventricle to pass to the body [1] Second circulation- Deoxygenated blood from body comes to right atrium,to right ventricle to pass for oxygenation to the lungs [1] **OR** Blood flows into the nephron through a branch of the renal artery [0.5] Breaks into a bunch of capillaries called glomerulus [0.5] Capillaries surround the renal tubule for fitration/reabsorbtion [0.5] Capillaries join back to form a branch of the renal vein which carries the blood out of the nephron [0.5]	2
24	From Snells law of refraction, Sini/Sin r= n [0.5] Since angle of incidence is minimum in block X, the refractive index of material of block X is also minimum.	2

	Refractive index of a material is given by n=c/v [0.5] The refractive index of material of block X is minimum, speed of light is maximum in medium X. Speed in X> speed in Y> speed in Z [1]	

25	They will repel each other [1] The right end of magnet X and left end of magnet Y are both north poles as field lines start from north pole and ends at south pole outside the magnet. [1] OR Heat produced depends on [1.5] i)Square of current flowing through the conductor ii)Resistance of the conductor iii)Time for which current is flowing through the conductor Practical application of heating effect: Electrical heater or Fuse (Any one) [0.5]	2
26	a) Grass---->Mouse----→ Eagle (no marks for incomplete chain) [1] b) The eagle will be most affected. [0.5] Biomagnification [0.5]	2
	Section–C	
27	i) $ZnCO_3$ [0.5] ii) Calcination: [0.5] Heating ore in limited supply or absence of air. $ZnCO_3 \rightarrow ZnO + CO_2$. [1] Reduction or displacement. [1] $ZnO + C \rightarrow Zn + CO$ OR $ZnO + Al \rightarrow Zn + Al_2O_3$	3
28	i) Sodium Bicarbonate, $NaHCO_3$. [0.5+0.5] ii) $NaCl + H_2O + CO_2 + NH_3 \rightarrow NaHCO_3 + NH_4Cl$. [1] iii) As antacid. $NaHCO_3 + HCl \rightarrow Na_2CO_3 + H_2O + CO_2$ In fire extinguisher: $2NaHCO_3 + H_2SO_4 \rightarrow Na_2SO_4 + H_2O + 2CO_2$. (any one) [1] OR i) Y- H_2, Z- Cl_2 [0.5+0.5] electricity ii) $NaCl + H_2O$ ----------→ $NaOH + Cl_2 + H_2$ [1] iii) $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$. [1]	3
29	i) P- Passes impulse from sensory to motor neuron, Q- Carries impulse from CNS towards effector organ,R- Carries impulse from receptor towards CNS [0.5+0.5+0.5] ii) Synapse [0.5] Neurotransmitters are released and electrical signal are changed to chemical impulse and back to electrical impulse at the dendritic tip of the next neuron [1]	3

30	i) Tt (tall) x Tt (tall) [0.5] Tt (tall) x tt (dwarf) [0.5] tt(dwarf) x tt (dwarf) [0.5] (If phenotypes are not mentioned overall 0.5 may be reduced) ii) Parent genotypes (Any of the above parental combination) [0.5] Gamete formation [0.5] F1 offsprings [0.5]	3
31	The power of a lens is 1D when focal length is 1m [0.5] P_1=100/10 = +10D, P_2= - 100/5 = - 20D [0.5+0.5] P=10+(-20) = -10D [0.5] f=1/P= -1/10=0.1m= -10cm [1]	3
32	i)Resistivity will not change as it depends on the nature of the material of the conductor. [1] ii)The length of each part becomes L/4. ρ, A constant. R=ρL/A. Resistance of each part = Rpart= (ρL/4)/A = R/4 [0.5] (a) In parallel Reqv = R/4x4= R/16 Ω [1] (b) In series the Reqv= R/4+ R/4 +R/4+R/4=R Ω [0.5]	3
33	i) Pin P [1] ii) to the metallic body of the iron box [1] iii) It prevents severe shocks by providing a low resistance path for any leakage current to the metallic body of the iron box [1]	3
	Section–D	
34	i) (a) A- Ethene ; B- Ethane; C- chloroethane. [1.5] (b) $C_2H_6 + Cl_2$ ---------→ $C_2H_5Cl + HCl$. [1] Substitution reaction. [0.5] (c)   Cyclohexane Benzene [0.5+0.5] Benzene is unsaturated, cyclohexane is saturated. [0.5+0.5] **OR** i)(a) C- CH_3COOH; Ethanoic acid A – CH_3OH; Methanol S – CH_3COOCH_3; Methyl ethanoate [1.5] (if any one , name or formula is mentioned.) (b) $CH_3COOH + Na \rightarrow CH_3COONa + H_2$. [0.5]	5

	Conc. H_2SO_4 (c) $CH_3COOH + CH_3OH$ -------→ $CH_3COOCH_3 + H_2O$. [1] ii)  or 2-Methyl Propane Structure [0.5 +0.5] Name [0.5 + 0.5]	
35	i) R- fertilization, T-mitotic division [0.5+0.5] ii) P- egg cell, haploid with 'x' as sex chromosome/22+X Q- sperm cell, haploid with 'x' as sex chromosome/22+X [1] iii) Before implantation- Uterus lining thickens and is supplied with blood vessels [0.5] After implantation- Disc like placenta develops,contains villi on the embryos side and blood spaces that surround the villi. Important for exchange of nutrition,gases and waste between mother and foetus. Development takes approximately nine months. [2] Child is born due to rhythmic contractions of the uterus. [0.5] **OR** i)  Drawing and labelling (above or any other suitable diagram) [1] ii) Liver is an exocrine gland, pours secretion through a duct. [1] Adrenal is an endocrine gland, pours secretion directly into blood. [1] iii) Faster heart beat resulting in more oxygen supply to the muscles/blood flow. to the digestive system and skin reduced due to constriction of arterioles which diverts blood to the skeletal muscles/increased breathing due to contractions of diaphragm and rib muscles. [2]	5

36	i)Convex mirror (Identification) [0.5] R=5m, f=+2.5m, u= - 20m 1/v+1/u=1/f 1/v=1/f - 1/u 1/v=1/2.5+1/20 1/v=10/25+1/20 1/v=(40+5)/100 v=100/45 = +2.2m [0.5 x 4=2] ii)Concave mirror (Identification) [0.5]  [0.5 x 4=2] (two rays, arrows, object placed between pole and the focus) **OR** i)Convex lens. It forms a virtual and magnified image [0.5+0.5] ii)  [0.5 x 4=2] (two rays, arrows, object placed between optical centre and the focus) ii)f=+10cm, u= - 5cm 1/v -1/u=1/f 1/v=1/f + 1/u 1/v=1/10+1/ (-5) 1/v=1+(-2)/10 v= -10cm (0.5 x 4=2)	5

	Section–E	
37	i) X-C_2H_2; Y- C_2H_5OH. [1] ii) Butyne and Propanol. [1] iii) I – Alkane $C_n H_{2n+2}$. [2] II – Alkyne. $C_n H_{2n-2}$. **OR** iii) $CH_3OH < C_2H_5OH < C_3H_7OH < C_4H_9OH$. [1+1] Boiling point increases with molecular mass.	4
38	i)White fur is a recessive trait as it will express only in a homozygous condition [0.5+0.5] ii)BB, Bb [0.5+0.5] iii)Fluffy bb x Puffy Bb [2] B b b Bb bb b Bb bb 50 percent will have white fur **OR** iii)Bb (Fluffys brother) x bb (brothers partner) B b b Bb bb b Bb bb 50 percent of offsprings thus have white fur [2]	4
39	i) The lamps are in parallel. [1] ii) Advantages: If one lamp is faulty, it will not affect the working of the other lamps. They will also be using the full potential of the battery as they are connected in parallel(Any 2) [1] iii) The lamp with the highest power will glow the brightest. P=VI [1] In this case, all the bulbs have the same voltage. But lamp A has the highest current. Hence, for Lamp A, Power=5 x 30 Watt = 150 W. (the maximum). [1] **OR** iii) Total current=5+3+4+3=15A, V=30V [1] Energy=VIt=15x30x60=27000J [1]	4

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