INDIAN SCHOOL AL WADI AL KABIR
FINAL EXAMINATION (2025-2026)

CHEMISTRY

Class-XI-(2025-26)

SET: 1

MARKING SCHEME

1.	C. C_2H_6	**1**
2.	C. 14.93L	**1**
3.	D. All of the above	**1**
4.	B. Ununennium	**1**
5.	D.4,0	**1**
6.	B. zero	**1**
7.	C.Lewis concept	**1**
8.	D. $Zn + 2AgCN \rightarrow 2Ag + Zn(CN)_2$	**1**
9.	B. Zn is oxidised to Zn^{2+}ions	**1**
10.	C. have high boiling points and decompose below their boiling points	**1**
11.	B. 3° > 2° > 1°	**1**
12.	D. n-Hexane	**1**
13.	A. Both A and R are true, and R is the correct explanation of A.	**1**
14.	A. Both A and R are true, but R is the correct explanation of A.	**1**
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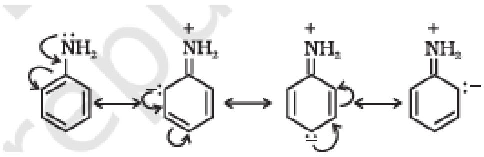
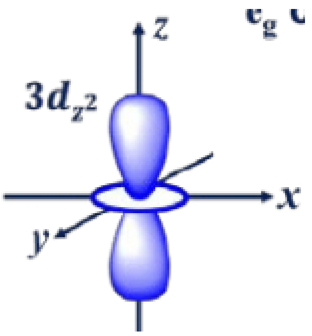
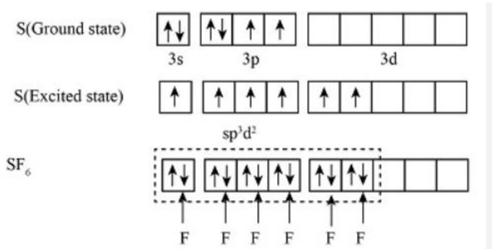
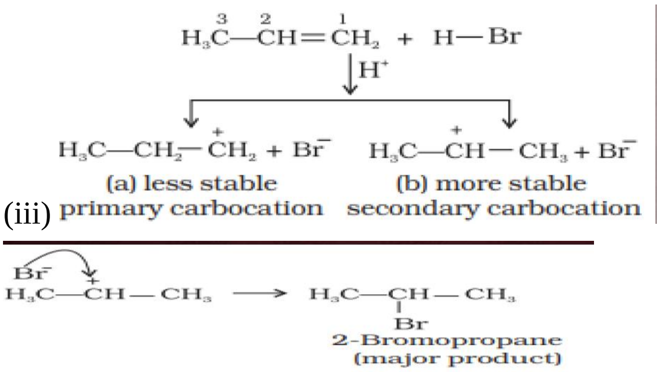
16.	A. Both A and R are true, and R is the correct explanation of A.	**1**
17.	Molarity = no of moles/vol of soln in litres = 5.6x1000/56x250 = 0.4 M **OR** B. Moles of Cl_2 required = 0.2 moles= 14.2 g Moles of Hcl = 0.4 moles =14.6 g og Hcl	**1 +1** **1** **1**
18.	(i) O has only two shells, due to a lesser atomic size, the e- e- repulsion happens. Hence, electron gain enthalpy is less than S, which has a bigger atomic size due to 3 shells (ii) F<Cl<Br<I	**1** **1**

19.	(a) Trigonal planar (b) Trigonal bipyramidal (c) Linear (d) octahedral	**½ x4=2**
20.	(i) O atom is getting oxidised and reduced in the same reaction (ii) Oxidation is losing electrons and reduction is gain of electrons	**1** **1**
21		**2**
22.	(a) One mole contains Avogadro's number of particles (b) Volume gets altered with temperature, hence the molarity too (c) Molality is the number of moles per mass of the solvent in kg	**1** **1** **1**
23.	(a) $\lambda = \frac{h}{mv}$ = $\lambda = \frac{6.626 \times 10^{-34}\ \text{Js}}{0.1\ \text{kg} \times 10\ \text{m/s}}$ = $\lambda = 6.626 \times 10^{-34}\ \text{m}$ (b) Pauli's exclusion principle states that no two electrons will have the same set of quantum numbers	**2** **1**
24.	(a) ns^2np^5 (b) Be has electronic configuration -($1s^22s^2$ while B has electronic configuration $1s^22s^22p^1$. Therefore in Be the outermost electron has to be removed from s orbital while in B the outermost electron has to be removed from p orbital which has comparatively less penetration than s orbital (c) Lithium (Li) shows a diagonal relationship with Magnesium (Mg) because they have similar atomic/ionic radii, electronegativity and charge/radius ratio	**1** **1** **1**
25.	(a) $\Delta G = \Delta H - T\Delta S$ = $0 = \Delta H - T\Delta S$ = $T = \frac{180000\ \text{J/mol}}{90\ \text{J/K/mol}}$ $T = 2000\ \text{K}$ (a) is the enthalpy change when one mole of a compound forms from its pure elements in their standard states	**2** **1**
26.	(a) $\Delta G^{\ominus} = -2.303 RT \log_{10}(K)$ $\Delta G^{\ominus}$ = -2.303x8.314x298x2 = 11411 J (b) $-\log 10^{-4}$ = 4	½ **1** ½ ½ ½

27.	I. $\overset{5}{C}H_3\overset{4}{C}H_2-\overset{3}{C}(=O)-\overset{2}{C}H_2-\overset{1}{C}HO$ II. $(C_6H_5)_2\dot{C}H$ Secondary free radical or more resonance structures III. Simple distillation; used to separate miscible liquids having a difference of boiling points higher than 20 K IV. A nucleophile is a chemical species (atom, ion, or molecule) that donates an electron pair to form a new covalent bond.eg.	**1** ½ +½ ½ + ½ ½ + ½
28.	(a) (i) $C_6H_5CH_3 + HCl$ (ii) $CH_3\text{-}C(OH)(CH_3)_2$ (b) The delocalized pi electron cloud makes Benzene electron-rich (c) $C_6H_6 + CH_3COCl \xrightarrow{\text{Anhydrous } AlCl_3} C_6H_5COCH_3 + HCl$	½ ½ **1** **1**
29.	I. 9 orbitals.18 electrons II. $1s^2, 2s^22p^6, 3s^2\ 3p^6\ 3d^{10}$ **OR** **$1s^2, 2s^22p^6, 3s^2\ 3p^6\ 3d^3$** III.a. Radial nodes = 0,angular nodes =1 b. 	**1** **1** **1** **1**
30.	I. ΔH = +ve and ΔS = +ve OR (a) $\Delta S_{universe} > 0$ (b) ΔS = -ve II. An ideal crystal has the lowest entropy (zero at 0 K) because its particles are fixed in a perfectly ordered, rigid lattice. Gaseous state has the highest entropy because its molecules are free, chaotic, and move rapidly, III. $\Delta U = q + W$ = $\Delta U = 701\ J + (-394\ J)$ $\Delta U = 307\ J$	½ + ½ ½ + ½ **1** **2**

31.	I. $CCl_4 < BCl_3 < BeCl_2$.	**1**
	II. $\sigma_{1s}^2, \sigma_{1s}^{*2}, \sigma_{2s}^2, \sigma_{2s}^{*2}, \pi_{2p_x}^2, \pi_{2p_y}^2, \sigma_{2p_z}^2$ $\text{Bond Order} = \frac{\text{No. of bonding electrons } (N_b) - \text{No. of antibonding electrons } (N_a)}{2} = \frac{10-4}{2} = \frac{6}{2} = 3.$	**2**
	 III.	**2**
	OR I. In SO_2, the central Sulphur atom has 2 bond pairs and 1 lone pair of electrons. Hence, an angular or "bent" shape. In SO_3, the central Sulphur atom has 3 bond pairs and 0 lone pairs of electrons. Hence trigonal planar shape.	**2**
	II. $(\sigma_{1s})^2(\sigma_{1s}^*)^2(\sigma_{2s})^2(\sigma_{2s}^*)^2(\sigma_{2p_z})^2(\pi_{2p_x})^2(\pi_{2p_y})^2(\pi_{2p_x}^*)^2(\pi_{2p_y}^*)^2$ $\text{Bond Order} = \frac{(N_b - N_a)}{2} = \frac{(10-8)}{2} = \frac{2}{2} = 1$	**2**
	III. Total sigma bonds = 10, Total pi bonds = 3	**1**
32.	A. I.Qc <Kc proceeds in the forward reaction II.(a) increasing pressure on the Haber process shifts the equilibrium towards the side with fewer gas molecules (right side), increasing the ammonia yield (b) no effect on the equilibrium position	**1x3**
	III. $K_c = \frac{[SO_3]^2}{[SO_2]^2[O_2]} = K_c = \frac{5^2}{(0.5)^2 \times 0.1} = 1000 \text{ mol}^{-1}$	**2**
	OR I. Buffer solutions resist significant changes in pH upon the addition of small amounts of strong acid or base. ethanoic acid and sodium ethanoate. II.(i) Decreasing the temperature causes the shift in the equilibrium position to the right. (ii) the equilibrium shifts to the right (iii) The equilibrium shifts to the left III. Kp= pCO2	**1x5**

33.	A	**2**
	(I) $C_2H_2 + 2HBr \rightarrow CH_3CHBr_2$	**1**
	(II) $C_6H_6 + HNO_3 \xrightarrow{H_2SO_4} C_6H_5NO_2 + H_2O.$	
	(iii) 	**2**
	OR	
	B	
	I. (a) $CH_3CH_2CH_2Br + \text{KOH (alcoholic)} \xrightarrow{\Delta} CH_3CH = CH_2 + KBr + H_2O.$	**1**
	(b) $C_6H_6 + HNO_3 \xrightarrow{H_2SO_4} C_6H_5NO_2 + H_2O.$	**1**
	(c) $CH_2 = CH_2 + [O] + H_2O \xrightarrow{\text{Cold, Alkaline } KMnO_4} \underset{\text{Ethane-1,2-diol}}{CH_2(OH) - CH_2(OH)}$	**1**
	II. $CH_3CH_2CH_2COONa + NaOH \xrightarrow{\text{CaO, Heat}} CH_3CH_2CH_3 + Na_2CO_3$	**1**
	III. But-2-ene; $CH_3 - CH = CH - CH_3 + O_3 \xrightarrow{Zn/H_2O} 2\,CH_3CHO$	**1**