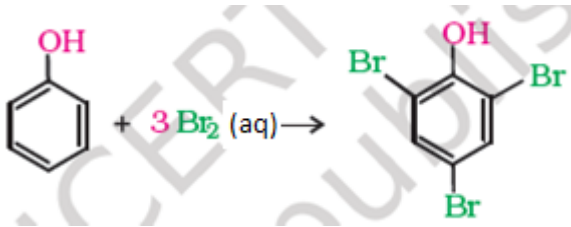
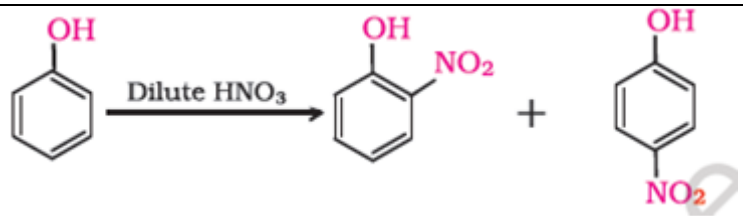
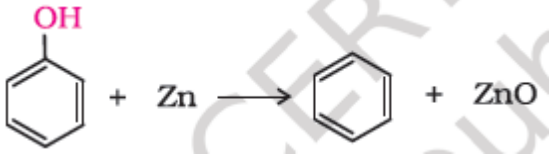
CHEMISTRY MARKING SCHEME
BLIND -2015
SET -56(B)

Ques.	Value Points	Marks
1	Rate = $-\frac{1}{3}\frac{d[H2]}{dt}$	1
2	Boiling / Electrophoresis/ Addition of an electrolyte	1
3	Hexaamminecobalt(III) chloride	1
4	Because it does not contain α-Hydrogen.	1
5	Due to resonance, C-O bond in phenol acquires a partial double bond character / sp^2 hybridised carbon of phenol.	1
6.	Because on addition of non-volatile solute , vapour pressure of the solution lowers down and therefore in order to boil the solution, temperature has to be increased, thus boiling point is higher. Because it depends on the number of solute particles.	1 1
7.	Galvanic cells that are designed to convert the energy of combustion of fuels directly into electrical energy. Advantage- ecofriendly / highly efficient	1 1
8.	a) Because of resonance in ozone molecule. b) Because of higher oxidation state of Pb in $PbCl_4$	1 1
	OR	
8.	All electrons in Xenon are paired. By promotion of one, two , or three electrons from filled p orbitals to vacant d orbitals in the valence shell, we get 2,4,6 unpaired electrons due to which we can get Xenon fluorides with even number of fluorine atoms only.	2
9.	A homogenous mixture of two or more elements in which one is always a metal is called an alloy. Misch metal. It is used to make bullets, shells, lighter flints(any one).	1 ½ ½
10	A- $CH_3CH=CH_2$ B- $CH_3CH_2CH_2Br$ C- $CH_3CH_2CH_2$-I D- $CH_3CH_2CH_2MgI$	½ ½ ½ ½

11	$\Delta T_f = i\, K_f\, m$ $\Delta T_f = i\ K_f \dfrac{w_b \times 1000}{M_b \times w_a}$ $1.62\ K = i \times 4.9\ K\ kg\ mol^{-1} \times \dfrac{3.9\ g}{122\ g mol^{-1}} \times \dfrac{1000\ g\ kg^{-1}}{49\ g}$ $i = 0.506$ Or by any other correct method As i<1 , therefore solute gets **associated.**	½ 1 ½ 1
12	**Λ_m = 46.1 Scm^2mol^{-1} c= 0.025 mol/L** $\Lambda^o_{HCOOH} = \lambda^o(H^+) + \lambda^o(HCOO^-)$ $= (349.6 + 54.6)\ Scm^2mol^{-1}$ $\Lambda^o_{HCOOH} = 404.2\ Scm^2mol^{-1}$ **$\alpha = \dfrac{\Lambda_m}{\Lambda^o}$** $= \dfrac{46.1\ Scm^2mol^{-1}}{404.2\ Scm^2mol^{-1}}$ **α = 0.114** **$K_c = c\,\alpha^2 / (1-\alpha)$ or $K_c = c\,\alpha^2$** **$= 0.025\ (0.114)^2 / (1-0.114)$ $= 0.025\ (0.114)^2$** **$= 3.67 \times 10^{-4}$ $= 3.25 \times 10^{-4}$**	1 1 1 1
13	$t = \dfrac{2.303}{k} \log \dfrac{[A_0]}{[A]}$ $t_{3/4} = \dfrac{2.303}{k} \log \dfrac{[A_0]}{1/4[A_0]}$ $t_{3/4} = \dfrac{2.303}{k} \log 4$ ……(i) $t_{1/2} = \dfrac{2.303}{k} \log \dfrac{[A_0]}{1/2\,[A_0]}$ $t_{1/2} = \dfrac{2.303}{k} \log 2$ …..(ii)	1 1

	Dividing equation (i) by (ii) $t_{3/4} = \frac{2.303}{k} \log 4$ $t_{1/2} = \frac{2.303}{k} \log 2$ $t_{3/4} = 2\ t_{1/2}$	1
14	**i) The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid is termed adsorption.** **ii) Settling of colloidal particles.** **iii) Colloids which are solvent/liquid hating.**	1 1 1
15	i)Mond Process ii) The melting point of alumina is very high. It is dissolved in cryolite which lowers the melting point and brings conductivity / acts as a solvent. iii) Roasting- Sulphide ores are converted into oxides by heating strongly in the presence of excess air. Calcination- In this process the ore is heated to a high temperature in the absence of air/ limited supply of air.	1 1 1

16	**i) Due to d-d transition / due to presence of unpaired electrons in d-orbitals.** **ii) Due to comparable energies of 5f, 6d and 7s orbitals.** **iii) Due to completely filled d-orbitals which lead to weak metallic bonding.**	1 1 1
	OR	
16	**i) $3d^3$ = (+2, +5)** **ii) $3d^5$ = (+3 , +6) / (+2 , +7)** **iii) $3d^8$ = +2** **(Ignore $3d^4$ configuration)**	1 1 1
17	i) d^2sp^3 , Paramagnetic, octahedral ii) Pentaamminenitrito-N-cobalt(III) nitrate	1+ ½ + ½ 1
18	A- $CH_3CH(Br)CH_3$ B- $CH_3CH(OH)CH_3$ C- $CH_3CH(Cl)CH_3$	1 1 1
19	i)  ii)	1 1

	 iii) 	1
20	a) i) Add Hinsberg reagent(benzene sulphonyl chloride) to both compounds. $(CH_3)_2NH$ forms ppt insoluble in KOH while $(CH_3)_3N$ does not react. ii) Add ice cold ($NaNO_2$ +HCl) followed by β-Naphthol to both the compounds. Aniline forms orange –red dye , while ethyl amine does not. b) N-methylaminoethane / N-methylethanamine	1 1 1
21	a) Caplrolactum b) Fibres c) Terrylene / Dacron / Nylon	1 1 1
22	i) Antacid- medicine used to treat acidity ii) Antiseptic- kills or prevent the growth of microorganisms when applied to living tissues. iii) Tranquilizers- treatment of stress and mental diseases.	1 1 1
23	i) Vitamin B_{12} ii) Vitamins are organic compounds required in diet in small amounts to perform specific biological functions for normal maintenance of optimum growth and health of an organism. Classification : Fat soluble vitamins , water soluble vitamins iii) Responsible / helpful / caring (any other) (any two values)	1 1+1 ½ + ½
24	a) I)Stoichiometric defect ii)Schottky defect e.g. NaCl iii)Density of a crystal decreases b) .	1 ½ + ½ 1 1+1

Crystalline	Amorphous
Definite shape / geometrical shape	Irregular shape
Sharp melting point	Gradually melt over a range
	(or any other correct difference)

OR

24	a) . <table><tr><td>Conductors</td><td>Semiconductors</td><td>Insulators</td></tr><tr><td>Energy gap between partially filled valence band and unoccupied conduction band is negligible and electron flow readily takes place.</td><td>There is small energy gap due to which some electrons jump to conduction band and show electrical conductivity</td><td>Energy gap is very large and no electron jump is feasible from valence band to conduction band</td></tr><tr><td>Copper metal</td><td>Silicon</td><td>Diamond (or any other example)</td></tr></table> b)With rise in temperature the kinetic energy of electrons increases due to which more electrons can move from valence band to conduction band. c) XY_3	½ × 3 ½ ×3 1 1
25	A- White phosphorous B- Red phosphorous C- Phosphine D- PCl_5 E- H_3PO_4	1×5=5
	OR	
25	i) Because of absence of hydrogen bonding in H_2S / Because of strong hydrogen bonding in Water. ii) Because of stability of +4 oxidation state increases from S to Te iii) Because of lowest bond dissociation enthalpy/ least thermal stability of H_2Te iv) Because the size of bismuth is larger than Sb , so Bi-H bond is weaker. v) Because HF reacts with sodium silicate (glass).	1 × 5

26	A- $(CH_3CO)_2O$ B- CH_3COOH C- $CH_3COOC_2H_5$ D- C_2H_5OH E- CH_3COCH_3	1× 5
	OR	
26	a) I)$C_6H_5COCl \xrightarrow{H_2/\ Pd\text{-}BaSO4} C_6H_5CHO$ ii)$CH_3CH(OH)CH_3 \xrightarrow{Cu/573\ K} CH_3COCH_3$ (or by any other suitable method) b) I)Heat both the compounds with I_2 and NaOH in separate test tubes, pentan-2-one gives yellow ppt of iodoform, while pentan-3-one does not. ii)Heat both the compounds seperately with I_2 and NaOH , acetophenone gives yellow ppt of iodoform, while benzaldehyde does not. (or any other correct test) c) Because of resonance in carboxylic group the carbonyl group loses a double bond character.	1 1 1 1 1 1

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