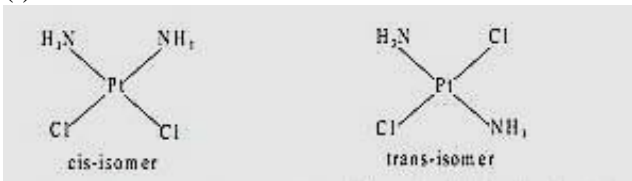
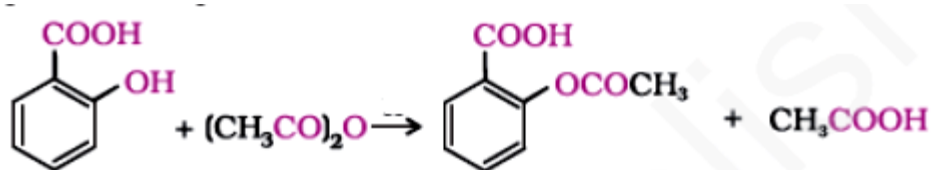



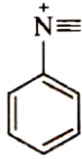

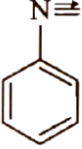
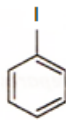
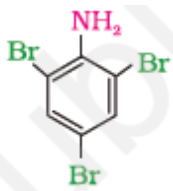
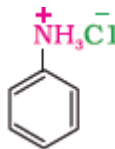
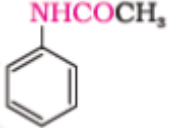
CHEMISTRY MARKING SCHEME**DELHI -2015****SET -56/1/2/D**

Qu es.	Value points	Marks
1	CH ₃ -CH ₂ -Br Because it is a primary halide / (1 ⁰) halide	½ +½
2	BaCl ₂ because it has greater charge / +2 charge	½ +½
3	X ₂ Y ₃	1
4	3	1
5	2, 5 - dinitrophenol	1
6.	(i)LiAlH ₄ / NaBH ₄ /H ₂ , Pt (ii)KMnO ₄ , KOH	1 1
7.	When vapour pressure of solution is higher than that predicted by Raoult's law / the intermolecular attractive forces between the solute-solvent/(A-B) molecules are weaker than those between the solute-solute and solvent-solvent molecules/A-A or B-B molecules. Eg. ethanol-acetone/ethanol-cyclohexane/CS ₂ -acetone or any other correct example $\Delta_{\text{mix}}H$ is positive OR (a)Azeotropes are binary mixtures having the same composition in the liquid and vapour phase and boil at a constant temperature. (b) Minimum boiling azeotrope eg - ethanol + water or any other example	1 ½ ½ 1 ½ ½
8.	(i)Ag ⁺ (aq) + e ⁻ → Ag (s) Reaction with higher E ⁰ value / ΔG^0 negative (ii) Molar conductivity of a solution at infinite dilution or when concentration approaches zero Number of ions per unit volume decreases	½ ½ ½ ½
9.	Elements which have partially filled d-orbital in its ground states or any one of its oxidation states. 1) Variable oxidation states 2) Form coloured ion Or any other two correct characteristics	1 ½ +½
10	1) Diamminedichloridoethylenediaminechromium(III) chloride 2) [Co(NH ₃) ₅ (ONO)] ²⁺	1+ 1

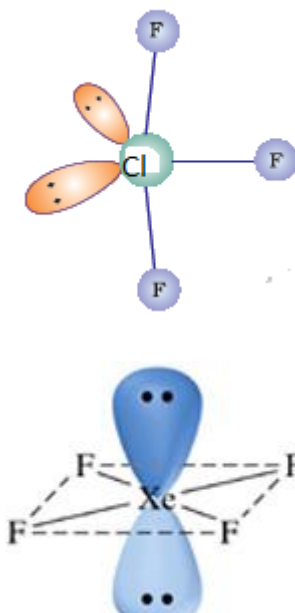
11	<p>(i)</p>  <p>(ii) $t_2g^3 e_g^1$ (iii) sp^3, diamagnetic</p>	1 1 $\frac{1}{2} + \frac{1}{2}$
12	<p>The cell reaction : $Fe(s) + 2H^+(aq) \rightarrow Fe^{2+}(aq) + H_2(g)$</p> $E_{cell}^{\circ} = E_c^{\circ} - E_a^{\circ}$ $= [0 - (-0.44)]V = 0.44V$ $E_{cell} = E_{cell}^{\circ} - \frac{0.059}{2} \log \frac{[Fe^{2+}]}{[H^+]^2}$ $E_{cell} = 0.44 V - \frac{0.059}{2} \log \frac{(0.001)}{(0.01)^2}$ $= 0.44 V - \frac{0.059}{2} \log (10)$ $= 0.44 V - 0.0295 V$ $\approx \mathbf{0.410 V}$	1 1 1
13	<p>(i) mutual coagulation (ii) strong interaction between dispersed phase and dispersion medium or solvated layer (iii) CO acts as a poison for catalyst.</p>	1 1 1
14	<p>(i) Hexamethylene diamine $NH_2(CH_2)_6NH_2$ and adipic acid $HOOC-(CH_2)_4-COOH$ (ii) 3 hydroxybutanoic acid $CH_3CH(OH)CH_2COOH$ and 3 hydroxypentanoic acid $CH_3CH_2CH(OH)CH_2COOH$ (iii) Chloroprene $H_2C=C(Cl)CH=CH_2$ IUPAC names are accepted</p> <p>Note : $\frac{1}{2}$ mark for name /s and $\frac{1}{2}$ mark for structure / s</p>	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
15	<p>(i) $CH_3CH_2CH_3$ (ii) $C_6H_5COONa + CHI_3$ (iii) CH_4</p>	1 $\frac{1}{2}, \frac{1}{2}$ 1

16.	<p>(i) $C_6H_5OH + NaOH \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ Or $C_6H_5OH + Na \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$</p> <p>(ii) $CH_3CH(OH)CH_3 \xrightarrow{CrO_3 \text{ or } Cu/573K} CH_3COCH_3 \xrightarrow[\text{(ii) } H_2O]{\text{(i) } CH_3MgX} (CH_3)_2C(OH)CH_3$</p> <p>(iii) $C_6H_5NH_2 \xrightarrow[273K]{NaNO_2 + HCl} C_6H_5N_2Cl \xrightarrow{H_2O \text{ warm}} C_6H_5OH$</p> <p>OR</p> <p>a)</p> <p>(i) $CH_3-CH_2-\ddot{O}-H + H^+ \rightarrow CH_3-CH_2-\overset{H}{\underset{+}{O}}-H$</p> <p>(ii) $CH_3CH_2-\overset{+}{O}-H + CH_3-CH_2-\overset{+}{O}-H \rightarrow CH_3CH_2-\overset{+}{O}-CH_2CH_3 + H_2O$</p> <p>(iii) $CH_3CH_2-\overset{+}{O}-CH_2CH_3 \rightarrow CH_3CH_2-O-CH_2CH_3 + H^+$</p> <p>b)</p>  <p>(Acetyl chloride instead of acetic anhydride may be used)</p>	1 1 1 1/2 1/2 1 1
17	<p>(i) Maltose</p> <p>(ii) fibrous proteins: parallel polypeptide chain, insoluble in water Globular proteins: spherical shape, soluble in water, (or any 1 suitable difference)</p> <p>(iii) Vitamin D</p>	1 1 1
18	<p>(i) Larger surface area, higher van der Waals' forces, higher the boiling point</p> <p>(ii) Rotation due to one enantiomer is cancelled by another enantiomer</p> <p>(iii) $-NO_2$ acts as Electron withdrawing group or $-I$ effect</p>	1 1 1

19	$\Delta T_f = i K_f m$ $\Delta T_f = i K_f \frac{m_b \times 1000}{M_b \times m_a}$ $1.62 \text{ K} = i \times 4.9 \text{ K kg mol}^{-1} \times \frac{3.9 \text{ g}}{122 \text{ gmol}^{-1}} \times \frac{1000}{49 \text{ kg}}$ $i = 0.506$ <p>Or by any other correct method</p> <p>As $i < 1$, therefore solute gets associated.</p>	<p>1/2</p> <p>1</p> <p>1/2</p> <p>1</p>
20	<p>(i) Zinc being low boiling will distil first leaving behind impurities/ or on electrolysis the pure metal gets deposited on cathode from anode.</p> <p>(ii) Silica acts as flux to remove iron oxide which is an impurity as slag or $\text{FeO} + \text{SiO}_2 \rightarrow \text{FeSiO}_3$</p> <p>(iii) Wrought iron</p>	<p>1</p> <p>1</p> <p>1</p>
21	$d = \frac{z \times M}{a^3 N_A}$ $z = \frac{d a^3 N_A}{M}$ $z = \frac{2.7 \text{ g cm}^{-3} \times 6.022 \times 10^{23} \text{ mol}^{-1} \times (4.05 \times 10^{-8} \text{ cm})^3}{27 \text{ g mol}^{-1}}$ $= 3.999 \approx 4$ <p>Face centered cubic cell/ fcc</p>	<p>1/2</p> <p>1</p> <p>1/2</p> <p>1</p>
22	<p>(i) 5f orbital electrons have poor shielding effect than 4f</p> <p>(ii) due to d-d transition / or the energy of excitation of an electron from lower d orbital to higher d-orbital lies in the visible region /presence of unpaired electrons in the d-orbital.</p> <p>(iii) $2 \text{ MnO}_4^- + 6 \text{ H}^+ + 5 \text{ NO}_2^- \rightarrow 2 \text{ Mn}^{2+} + 3 \text{ H}_2\text{O} + 5 \text{ NO}_3^-$</p>	<p>1</p> <p>1</p> <p>1</p>
23	<p>(i) Concern for students health, Application of knowledge of chemistry to daily life, empathy, caring or any other</p> <p>(ii) Through posters, nukkad natak in community, social media, play in assembly or any other</p> <p>(iii) Tranquilizers are drugs used for treatment of stress or mild and severe mental disorders .. Eg: equanil (or any other suitable example)</p> <p>(iv) Aspartame is unstable at cooking temperature.</p>	<p>1/2, 1/2</p> <p>1</p> <p>1/2, 1/2</p> <p>1</p>

24	<p>A =  B =  C =  D =  E = </p> <p style="text-align: center;">OR</p> <p>24.</p> <p>a. i)</p> <p> ii)  iii) </p> <p>b. $(\text{CH}_3)_3\text{N} < \text{C}_2\text{H}_5\text{NH}_2 < \text{C}_2\text{H}_5\text{OH}$ c. By Hinsberg test secondary amines $(\text{CH}_3)_2\text{NH}$ shows ppt formation which is insoluble in KOH, tertiary amines $(\text{CH}_3)_3\text{N}$ do not react with benzene sulphonyl chloride</p>	<p>1x5= 5</p> <p>1 1 1</p> <p>1 1</p>
25	<p>(a)</p> $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $k = \frac{2.303}{30} \log \frac{0.60}{0.30}$ $k = \frac{2.303}{30} \times 0.301 = 0.023 \text{ s}^{-1}$ $k = \frac{2.303}{60} \log \frac{0.60}{0.15}$ $k = \frac{2.303}{60} \times 0.6021 = 0.023 \text{ s}^{-1}$	<p>1</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>1</p>

	<p>As k is constant in both the readings, hence it is a pseudofirst order reaction.</p> <p>ii)</p> $\text{Rate} = - \Delta[R]/\Delta t$ $= \frac{-[0.15-0.30]}{60-30}$ $= 0.005 \text{ mol L}^{-1}\text{s}^{-1}$ <p style="text-align: center;">OR</p> <p>a)</p> <p>25. (i) Rate will increase 4 times of the actual rate of reaction.</p> <p>(ii) Second order reaction</p> <p>b) $t_{1/2} = \frac{0.693}{k}$</p> $30\text{min} = \frac{0.693}{k}$ $k = 0.0231\text{min}^{-1}$ $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $t = \frac{2.303}{0.0231} \log \frac{100}{10}$ $t = \frac{2.303}{0.0231} \text{ min}$ $t = 99.7\text{min}$	<p>½</p> <p>½</p> <p>1</p> <p>1+1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>1</p>
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26.	<p>(a) (i) Due to decrease in bond dissociation enthalpy from HF to HI , there is an increase in acidic character observed.</p> <p>(ii)Oxygen exists as diatomic O₂ molecule while sulphur as polyatomic S₈</p> <p>(iii)Due to non availability of d orbitals</p>	1 1 1
	<p>(b)</p> 	1 1
26.	<p style="text-align: center;">OR</p> <p>(i) White Phosphorus because it is less stable due to angular strain</p> <p>(ii)Nitrogen oxides emitted by supersonic jet planes are responsible for depletion of ozone layer. Or $\text{NO} + \text{O}_3 \rightarrow \text{NO}_2 + \text{O}_2$</p> <p>(iii)due to small size of F, large inter electronic repulsion / electron- electron repulsion among the lone pairs of fluorine</p> <p>(iv)Helium</p> <p>(v) $\text{XeF}_2 + \text{PF}_5 \rightarrow [\text{XeF}]^+ [\text{PF}_6]^-$</p>	$\frac{1}{2}, \frac{1}{2}$ 1 1 1 1 1