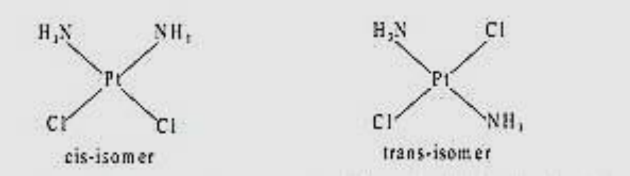
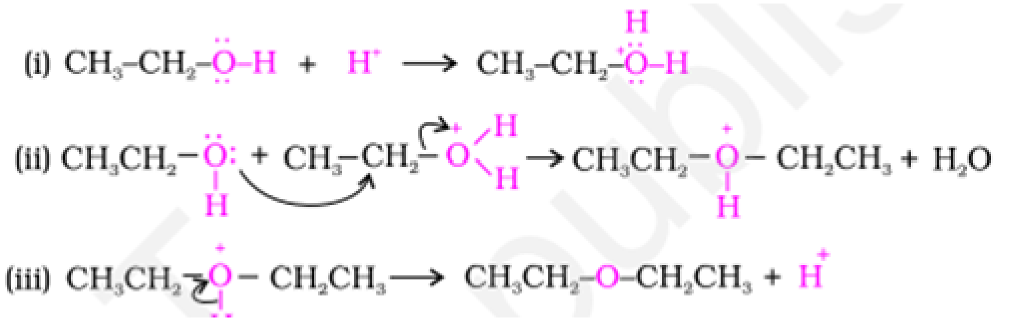
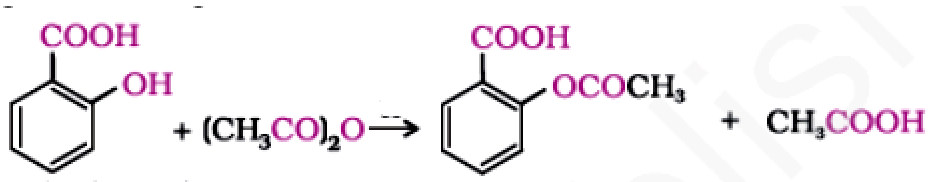
CHEMISTRY MARKING SCHEME
DELHI -2015
SET -56/1/1/D

Ques.	Value points	Marks
1	3	1
2	2, 5 - dinitrophenol	1
3	CH_3-CH_2-Br Because it is a primary halide / (1^0) halide	½ +½
4	$BaCl_2$ because it has greater charge / +2 charge	½ +½
5	X_2Y_3	1
6.	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
7.	1) Diamminedichloridoethylenediaminechromium(III) chloride 2) $[Co(NH_3)_5(ONO)]^{2+}$	1+ 1
8.	(i)$LiAlH_4$ / $NaBH_4$ /H_2, Pt (ii)$KMnO_4$, KOH	1 1
9	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 $\Delta_{mix}H$ is positive **OR**	1 ½ ½
9.	(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
10	(i)$Ag^+ (aq) + e^- \rightarrow Ag (s)$ 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

11	$\Delta T_f = i\ K_f\ m$ $\Delta T_f = i\ K_f\ \frac{w_b \times 1000}{M_b \times w_a}$ $1.62\ K = i \times 4.9 K\ kg\ mol^{-1} \times \frac{3.9\ g}{122\ gmol^{-1}} \times \frac{1000}{49\ kg}$ $i = 0.506$ Or by any other correct method As i<1 , therefore solute gets **associated.**	½ 1 ½ 1
12	(i) Zinc being low boiling will distil first leaving behind impurities/ or on electrolysis the pure metal gets deposited on cathode from anode. (ii)Silica acts as flux to remove iron oxide which is an impurity as slag or $FeO + SiO_2 \rightarrow FeSiO_3$ (iii)Wrought iron	1 1 1
13	$d = \frac{z \times M}{a^3 N_A}$ $z = \frac{d\ a^3 N_A}{M}$ $\mathbf{z = \frac{2.7\ g\ cm^{-3} \times 6.022 \times 10^{23}\ mol^{-1} \times (4.05 \times 10^{-8} cm)^3}{27\ g\ mol^{-1}}}$ $= 3.999 \approx 4$ Face centered cubic cell/ fcc	½ 1 ½ 1
14	(i) 5f orbital electrons have poor shielding effect than 4f (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. (iii) $2\ MnO_4^- + 6\ H^+ + 5\ NO_2^- \rightarrow 2\ Mn^{2+} + 3\ H_2O + 5\ NO_3^-$	1 1 1
15	(i)  (ii)$t_{2g}^3 e_g^1$ (iii) sp^3 , diamagnetic	 1 1 ½+½

16	The cell reaction : $Fe(s) + 2H^+ (aq) \rightarrow Fe^{2+} (aq) + H_2(g)$ $E^o_{cell} = E^o_c - E^o_a$ $= [0-(-0.44)]V=0.44V$ $E_{cell} = E^o_{cell} - \frac{0.059}{2} \log \frac{[Fe^{2+}]}{[H^+]^2}$ $E_{cell} = 0.44\ V - \frac{0.059}{2} \log \frac{(0.001)}{(0.01)^2}$ $= 0.44\ V - \frac{0.059}{2} \log (10)$ $= 0.44\ V - 0.0295\ V$ **$=\approx$ 0.410 V**	1 1 1
17	(i) mutual coagulation (ii)strong interaction between dispersed phase and dispersion medium or solvated layer (iii)CO acts as a poison for catalyst	1 1 1
18	(i)Hexamethylene diamine $NH_2 (CH_2)_6 NH_2$ 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 Note : ½ mark for name /s and ½ mark for structure / s	½ ½ ½ ½ ½ ½
19	(i)$CH_3CH_2CH_3$ (ii) $C_6H_5COONa + CHI_3$ (iii)CH_4	1 ½, ½ 1
20	(i) $C_6H_5OH + NaOH \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ Or $C_6H_5OH + Na \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ (ii)$CH_3CH(OH)CH_3 \xrightarrow{CrO_3 \text{ or } Cu/573K} CH_3COCH_3 \xrightarrow[(ii)H_2O]{(i)CH_3MgX} (CH_3)_2C(OH)CH_3$ (iii)$C_6H_5NH_2 \xrightarrow[273K]{NaNO_2 + HCl} C_6H_5N_2Cl \xrightarrow{H_2O \text{ warm}} C_6H_5OH$	1 1 1

20	OR a)  b)  (Acetyl chloride instead of acetic anhydride may be used)	½ ½ 1 1
21	(i)Maltose (ii) fibrous proteins: parallel polypeptide chain , insoluble in water Globular proteins: spherical shape, soluble in water, (or any 1 suitable difference) (iii) Vitamin D	1 1 1
22	(i)Larger surface area, higher van der Waals' forces , higher the boiling point (ii)Rotation due to one enantiomer is cancelled by another enantiomer (iii) - NO_2 acts as Electron withdrawing group or –I effect	1 1 1
23	(i) Concern for students health, Application of knowledge of chemistry to daily life, empathy , caring or any other (ii)Through posters, nukkad natak in community, social media, play in assembly or any other (iii)Tranquilizers are drugs used for treatment of stress or mild and severe mental disorders .. Eg: equanil (or any other suitable example) (iv) Aspartame is unstable at cooking temperature.	½, ½ 1 ½ , ½ 1
24	(a) (i) Due to decrease in bond dissociation enthalpy from HF to HI , there is an increase in acidic character observed. (ii)Oxygen exists as diatomic O_2 molecule while sulphur as polyatomic S_8 (iii)Due to non availability of d orbitals	1 1 1

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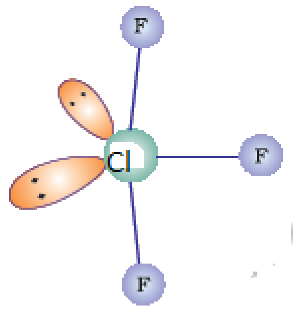

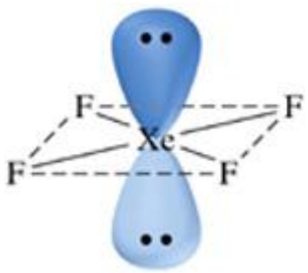

OR

(i) White Phosphorus because it is less stable due to angular strain
(ii)Nitrogen oxides emitted by supersonic jet planes are responsible for depletion of ozone layer.
Or $NO + O_3 \rightarrow NO_2 + O_2$
(iii)due to small size of F, large inter electronic repulsion / electron- electron repulsion among the lone pairs of fluorine
(iv)Helium
(v) $XeF_2 + PF_5 \rightarrow [XeF]^+ [PF_6]^-$
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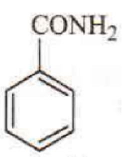
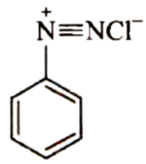
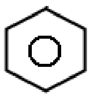
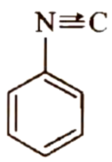
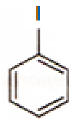
A = 

B = 

C = 
D = 

E = 

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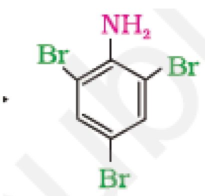
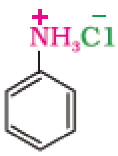
OR

a. i)


ii) 

iii) 

b. $(CH_3)_3N < C_2H_5NH_2 < C_2H_5OH$
c. By Hinsberg test secondary amines $(CH_3)_2NH$ shows ppt formation which is insoluble i

tertiary amines $(CH_3)_3N$ do not react with benzene sulphonyl choride
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26	(a) $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $k = \frac{2.303}{30} \log \frac{0.60}{0.30}$ $k = \frac{2.303}{30} \times 0.301 = 0.023\ s^{-1}$ $k = \frac{2.303}{60} \log \frac{0.60}{0.15}$ $k = \frac{2.303}{60} \times 0.6021 = 0.023\ s^{-1}$ As k is constant in both the readings, hence it is a pseudofirst order reaction. ii) Rate = $- \Delta[R]/\Delta t$ $= -\frac{[0.15-0.30]}{60-30}$ $= 0.005\ mol\ L^{-1}s^{-1}$	1 ½ ½ 1 ½ ½ 1
	OR	
26	a) (i) Rate will increase 4 times of the actual rate of reaction. (ii) Second order reaction b) $t_{1/2} = \frac{0.693}{k}$ $30min = \frac{0.693}{k}$ $k = 0.0231 min^{-1}$	1+1 ½ ½

	$k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $t = \frac{2.303}{0.0231} \log \frac{100}{10}$ $t = \frac{2.303}{0.0231}$ min $t = 99.7$min	½ ½ 1

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

Ques.	Value points	Marks
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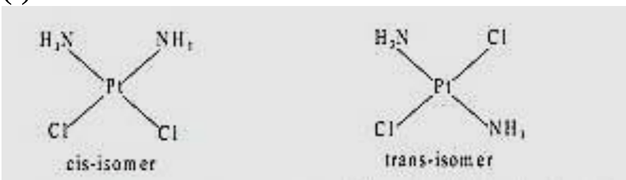
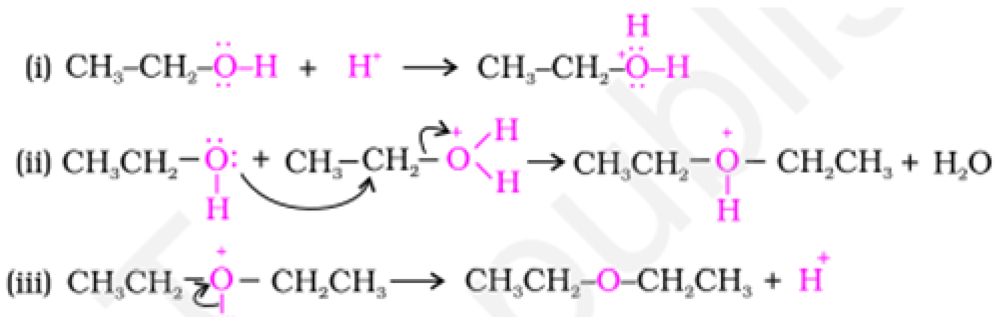
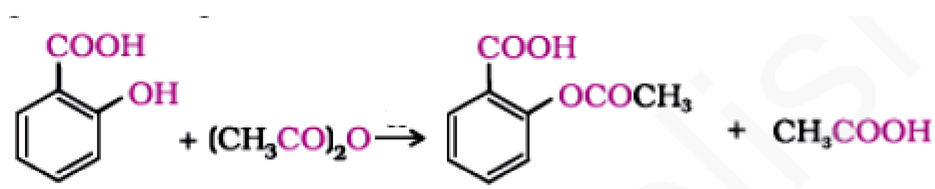
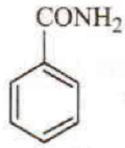
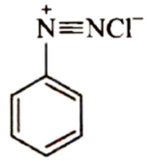
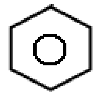
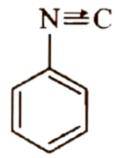
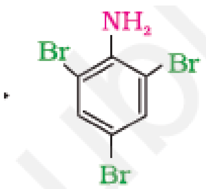
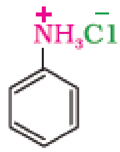
2	$BaCl_2$ because it has greater charge / +2 charge	½ +½
3	X_2Y_3	1
4	3	1
5	2, 5 - dinitrophenol	1
6.	(i)$LiAlH_4$ / $NaBH_4$ /H_2, Pt (ii)$KMnO_4$, KOH	1 1
7. 7.	When vapour pressure of solution is higher than that predicted by Raoult's law / the intermolecular attractive forces between the solute-solvent/(A-B) 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 $\Delta_{mix}H$ 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

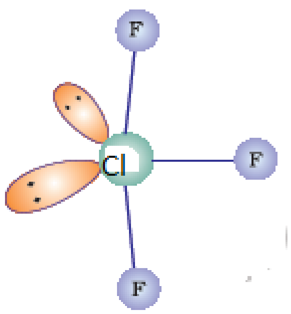
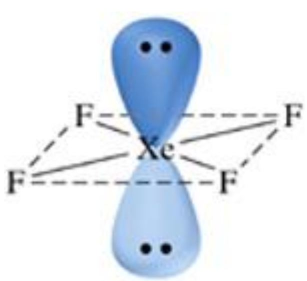
11	(i)  (ii)$t_{2g}^{3}\ e_{g}^{1}$ (iii) sp^3 , diamagnetic	1 1 ½+ ½
12	The cell reaction : $Fe(s) + 2H^+ (aq) \rightarrow Fe^{2+} (aq) + H_2(g)$ $E^o_{cell} = E^o_c - E^o_a$ $= [0-(-0.44)]V=0.44V$ $E_{cell} = E^o_{cell} - \frac{0.059}{2} \log \frac{[Fe^{2+}]}{[H^+]^2}$ $E_{cell} = 0.44\ V - \frac{0.059}{2} \log \frac{(0.001)}{(0.01)^2}$ $= 0.44\ V - \frac{0.059}{2} \log (10)$ $= 0.44\ V - 0.0295\ V$ **=≈ 0.410 V**	1 1 1
13	(i) mutual coagulation (ii)strong interaction between dispersed phase and dispersion medium or solvated layer (iii)CO acts as a poison for catalyst.	1 1 1
14	(i)Hexamethylene diamine $NH_2 (CH_2)_6 NH_2$ 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 Note : ½ mark for name /s and ½ mark for structure / s	½ ½ ½ ½ ½ ½
15	(i)$CH_3CH_2CH_3$ (ii) $C_6H_5COONa + CHI_3$ (iii)CH_4	1 ½, ½ 1

16.	(i) $C_6H_5OH + NaOH \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ Or $C_6H_5OH + Na \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ (ii) $CH_3CH(OH)CH_3 \xrightarrow{CrO_3 \text{ or } Cu/573K} CH_3COCH_3 \xrightarrow[(ii)H_2O]{(i)CH_3MgX} (CH_3)_2C(OH)CH_3$ (iii) $C_6H_5NH_2 \xrightarrow[273K]{NaNO_2 + HCl} C_6H_5N_2Cl \xrightarrow{H_2O \text{ warm}} C_6H_5OH$	1 1 1
16.	OR a)  b)  (Acetyl chloride instead of acetic anhydride may be used)	½ ½ 1 1
17	(i)Maltose (ii) fibrous proteins: parallel polypeptide chain , insoluble in water Globular proteins: spherical shape, soluble in water, (or any 1 suitable difference) (iii) Vitamin D	1 1 1
18	(i)Larger surface area, higher van der Waals' forces , higher the boiling point (ii)Rotation due to one enantiomer is cancelled by another enantiomer (iii) - NO_2 acts as Electron withdrawing group or –I effect	1 1 1

19	$\Delta T_f = i\, K_f\, m$ $\Delta T_f = i\ K_f\ \dfrac{m_b \times 1000}{M_b \times m_a}$ $1.62\ K = i \times 4.9 K\ kg\ mol^{-1} \times \dfrac{3.9\ g}{122\ gmol^{-1}} \times \dfrac{1000}{49\ kg}$ $i = 0.506$ Or by any other correct method As i<1 , therefore solute gets **associated.**	½ 1 ½ 1
20	(i) Zinc being low boiling will distil first leaving behind impurities/ or on electrolysis the pure metal gets deposited on cathode from anode. (ii)Silica acts as flux to remove iron oxide which is an impurity as slag or $FeO + SiO_2 \rightarrow FeSiO_3$ (iii)Wrought iron	1 1 1
21	$d = \dfrac{z \times M}{a^3 N_A}$ $z = \dfrac{d\, a^3 N_A}{M}$ $\mathbf{z = \dfrac{2.7\ g\ cm^{-3} \times 6.022 \times 10^{23}\ mol^{-1} \times (4.05 \times 10^{-8} cm)^3}{27\ g\ mol^{-1}}}$ $= 3.999 \approx 4$ Face centered cubic cell/ fcc	½ 1 ½ 1
22	(i) 5f orbital electrons have poor shielding effect than 4f (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. (iii) $2\ MnO_4^- + 6\ H^+ + 5\ NO_2^- \rightarrow 2\ Mn^{2+} + 3\ H_2O + 5\ NO_3^-$	1 1 1
23	(i) Concern for students health, Application of knowledge of chemistry to daily life, empathy , caring or any other (ii)Through posters, nukkad natak in community, social media, play in assembly or any other (iii)Tranquilizers are drugs used for treatment of stress or mild and severe mental disorders .. Eg: equanil (or any other suitable example) (iv) Aspartame is unstable at cooking temperature.	½, ½ 1 ½ , ½ 1

24 24.	A =  B =  C =  D =  E =  **OR** a. i)  ii)  iii)  b. ($(CH_3)_3N < C_2H_5NH_2 < C_2H_5OH$ c. By Hinsberg test secondary amines ($(CH_3)_2NH$ shows ppt formation which is insoluble in KOH , tertiary amines ($(CH_3)_3N$ do not react with benzene sulphonyl choride	1x5= 5 1 1 1 1 1
25	(a) $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $k = \frac{2.303}{30} \log \frac{0.60}{0.30}$ $k = \frac{2.303}{30} \times 0.301 = 0.023\ s^{-1}$ $k = \frac{2.303}{60} \log \frac{0.60}{0.15}$ $k = \frac{2.303}{60} \times 0.6021 = 0.023\ s^{-1}$	1 ½ ½ 1

25.	As k is constant in both the readings, hence it is a pseudofirst order reaction. ii) $\text{Rate} = -\Delta[R]/\Delta t$ $= -\frac{[0.15-0.30]}{60-30}$ $= 0.005 \text{ mol } L^{-1}s^{-1}$ OR a) (i) Rate will increase 4 times of the actual rate of reaction. (ii) Second order reaction b) $t_{1/2} = \frac{0.693}{k}$ $30\text{min} = \frac{0.693}{k}$ $k = 0.0231\text{min}^{-1}$ $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $t = \frac{2.303}{0.0231} \log \frac{100}{10}$ $t = \frac{2.303}{0.0231} \text{ min}$ $t = 99.7\text{min}$	½ ½ 1 1+1 ½ ½ ½ ½ 1

26.	(a) (i) Due to decrease in bond dissociation enthalpy from HF to HI , there is an increase in acidic character observed. (ii)Oxygen exists as diatomic O_2 molecule while sulphur as polyatomic S_8 (iii)Due to non availability of d orbitals	1 1 1
	(b)  	1 1
26.	**OR** (i) White Phosphorus because it is less stable due to angular strain (ii)Nitrogen oxides emitted by supersonic jet planes are responsible for depletion of ozone layer. Or $NO + O_3 \rightarrow NO_2 + O_2$ (iii)due to small size of F, large inter electronic repulsion / electron- electron repulsion among the lone pairs of fluorine (iv)Helium (v) $XeF_2 + PF_5 \rightarrow [XeF]^+ [PF_6]^-$	½ , ½ 1 1 1 1

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SET -56/1/3/D

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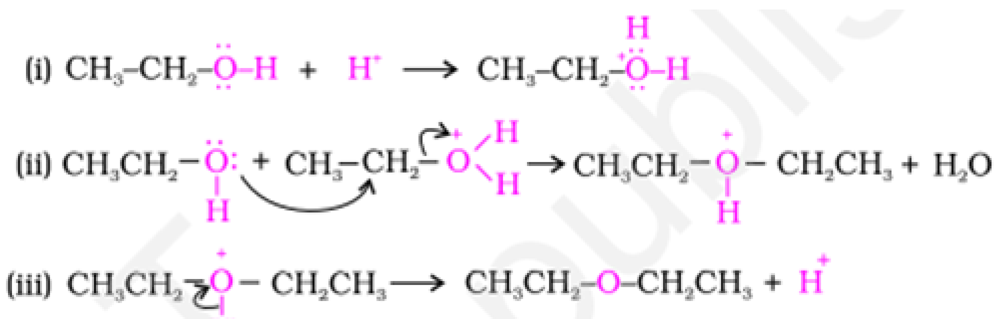
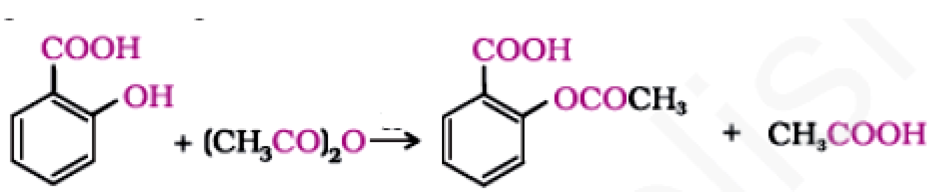
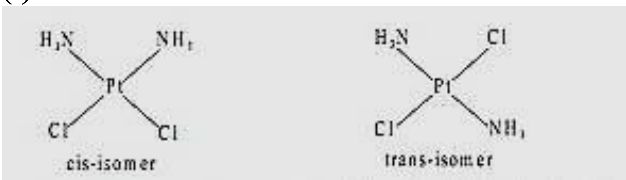
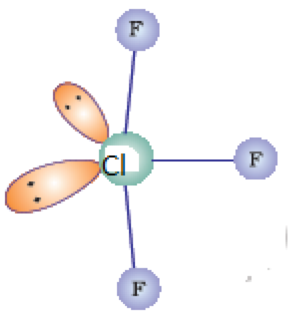
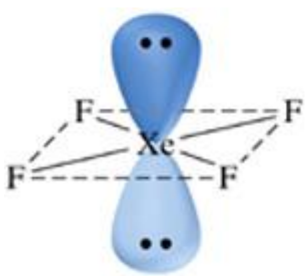
9.	1) Diamminedichloridoethylenediaminechromium(III) chloride 2) $[Co(NH_3)_5(ONO)]^{2+}$	1+ 1

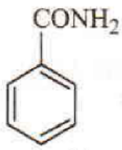
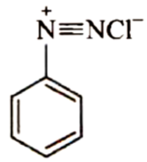
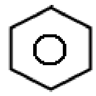
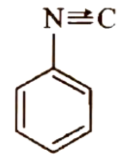
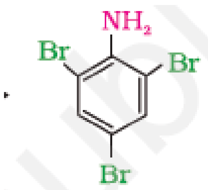
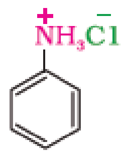
10	(i)$LiAlH_4$ / $NaBH_4$ /H_2, Pt (ii)$KMnO_4$, KOH	1 1
11	(i)Hexamethylene diamine $NH_2\ (CH_2)_6\ NH_2$ and adipic acid HOOC- $(CH_2)_4$- COOH (ii)3 hydroxybutanoic acid $CH_3CH(OH)CH_2COOH$ and 3 hydroxypentanoic acid $CH_3CH_2CH(OH)CH_2COOH$ (iii)Chloroprene $H_2C=C(Cl)CH=CH_2$ IUPAC names are accepted Note : ½ mark for name /s and ½ mark for structure / s	½ ½ ½ ½ ½ ½
12	(i)$CH_3CH_2CH_3$ (ii) $C_6H_5COONa + CHI_3$ (iii)CH_4	1 ½, ½ 1
13	(i) $C_6H_5OH + NaOH \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ Or $C_6H_5OH + Na \rightarrow C_6H_5ONa \xrightarrow{CH_3X} C_6H_5OCH_3$ (ii)$CH_3CH(OH)CH_3 \xrightarrow{CrO_3 \text{ or } Cu/573K} CH_3COCH_3 \xrightarrow[\text{(ii)}H_2O]{\text{(i)}CH_3MgX} (CH_3)_2C(OH)CH_3$ (iii)$C_6H_5NH_2 \xrightarrow[273K]{NaNO_2 + HCl} C_6H_5N_2Cl \xrightarrow{H_2O \text{ warm}} C_6H_5OH$	 1 1 1
	OR	
13	a)  b) 	 ½ ½ 1 1

	(Acetyl chloride instead of acetic anhydride may be used)	
14	(i)Maltose (ii) fibrous proteins: parallel polypeptide chain , insoluble in water Globular proteins: spherical shape, soluble in water, (or any 1 suitable difference) (iii) Vitamin D	1 1 1
15	(i)Larger surface area, higher van der Waals' forces , higher the boiling point (ii)Rotation due to one enantiomer is cancelled by another enantiomer (iii) - NO_2 acts as Electron withdrawing group or –I effect	1 1 1
16.	$\Delta T_f = i\ K_f\ m$ $\Delta T_f = i\ K_f\ \frac{m_b \times 1000}{M_b \times m_a}$ $1.62\ K = i \times 4.9 K\ kg\ mol^{-1} \times \frac{3.9\ g}{122\ gmol^{-1}} \times \frac{1000}{49\ kg}$ $i = 0.506$ Or by any other correct method As i<1 , therefore solute gets **associated.**	½ 1 ½ 1
17	(i) Zinc being low boiling will distil first leaving behind impurities/ or on electrolysis the pure metal gets deposited on cathode from anode. (ii)Silica acts as flux to remove iron oxide which is an impurity as slag or $FeO + SiO_2 \rightarrow FeSiO_3$ (iii)Wrought iron	1 1 1
18	$d = \frac{z \times M}{a^3 N_A}$ $z = \frac{d\ a^3 N_A}{M}$ $\mathbf{z = \frac{2.7\ g\ cm^{-3} \times 6.022 \times 10^{23}\ mol^{-1} \times (4.05 \times 10^{-8} cm)^3}{27\ g\ mol^{-1}}}$ $= 3.999 \approx 4$ Face centered cubic cell/ fcc	½ 1 ½ 1
19	(i) 5f orbital electrons have poor shielding effect than 4f (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. (iii) $2\ MnO_4^- + 6\ H^+ + 5\ NO_2^- \rightarrow 2\ Mn^{2+} + 3\ H_2O + 5\ NO_3^-$	1 1 1

20	(i)  (ii)$t_{2g}^{3} e_{g}^{1}$ (iii) sp^3 , diamagnetic	1 1 ½+ ½
21	The cell reaction : $Fe(s) + 2H^+ (aq) \rightarrow Fe^{2+} (aq) + H_2(g)$ $E^o_{cell} = E^o_c - E^o_a$ $= [0-(-0.44)]V=0.44V$ $E_{cell} = E^o_{cell} - \frac{0.059}{2} \log \frac{[Fe^{2+}]}{[H^+]^2}$ $E_{cell} = 0.44\ V - \frac{0.059}{2} \log \frac{(0.001)}{(0.01)^2}$ $= 0.44\ V - \frac{0.059}{2} \log (10)$ $= 0.44\ V - 0.0295\ V$ **=≈ 0.410 V**	1 1 1
22	(i) mutual coagulation (ii)strong interaction between dispersed phase and dispersion medium or solvated layer (iii)CO acts as a poison for catalyst or iron	1 1 1
23	(i) Concern for students health, Application of knowledge of chemistry to daily life, empathy , caring or any other (ii)Through posters, nukkad natak in community, social media, play in assembly or any other (iii)Tranquilizers are drugs used for treatment of stress or mild and severe mental disorders .. Eg: equanil (or any other suitable example) (iv) Aspartame is unstable at cooking temperature.	½, ½ 1 ½ , ½ 1

24	(a) $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $k = \frac{2.303}{30} \log \frac{0.60}{0.30}$ $k = \frac{2.303}{30} \times 0.301 = 0.023\ s^{-1}$ $k = \frac{2.303}{60} \log \frac{0.60}{0.15}$ $k = \frac{2.303}{60} \times 0.6021 = 0.023\ s^{-1}$ As k is constant in both the readings, hence it is a pseudofirst order reaction. ii) Rate = $-\Delta[R]/\Delta t$ $= -\frac{[0.15-0.30]}{60-30}$ $= 0.005\ mol\ L^{-1}s^{-1}$	1 ½ ½ 1 ½ ½ 1
	OR	
24.	a) (i) Rate will increase 4 times of the actual rate of reaction. (ii) Second order reaction b) $t_{1/2} = \frac{0.693}{k}$ $30min = \frac{0.693}{k}$	1+1 ½

	$k = 0.0231 min^{-1}$ $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $t = \frac{2.303}{0.0231} \log \frac{100}{10}$ $t = \frac{2.303}{0.0231}$ min t = 99.7min	½ ½ ½ 1
25 25	(a) (i) Due to decrease in bond dissociation enthalpy from HF to HI , there is an increase in acidic character observed. (ii)Oxygen exists as diatomic O_2 molecule while sulphur as polyatomic S_8 (iii)Due to non availability of d orbitals (b)   **OR** (i) White Phosphorus because it is less stable due to angular strain (ii)Nitrogen oxides emitted by supersonic jet planes are responsible for depletion of ozone layer. Or $NO+O_3 \rightarrow NO_2+ O_2$ (iii)due to small size of F, large inter electronic repulsion / electron- electron repulsion among the lone pairs of fluorine	1 1 1 1 1 ½ , ½ 1 1

	(iv)Helium (v) $XeF_2 + PF_5 \rightarrow [XeF]^+ [PF_6]^-$	1 1
26. 26.	A =  B =  C =  D =  E =  **OR** a. i)  ii)  iii)  b. $(CH_3)_3N < C_2H_5NH_2 < C_2H_5OH$ c. By Hinsberg test secondary amines $(CH_3)_2NH$ shows ppt formation which is insoluble in tertiary amines $(CH_3)_3N$ do not react with benzene sulphonyl choride	1x5= 5 1 1 1 1 1