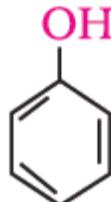
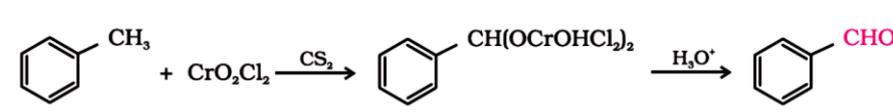
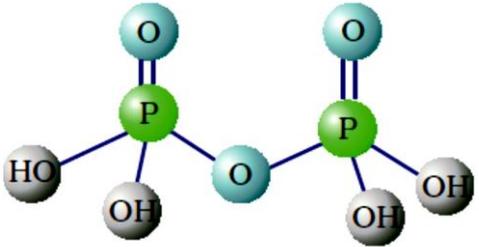
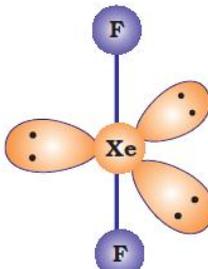


CHEMISTRY MARKING SCHEME 2015
SET -56/2/2 F

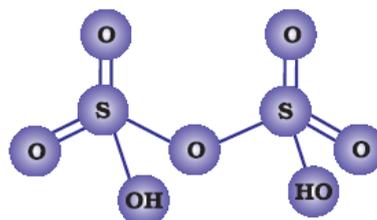
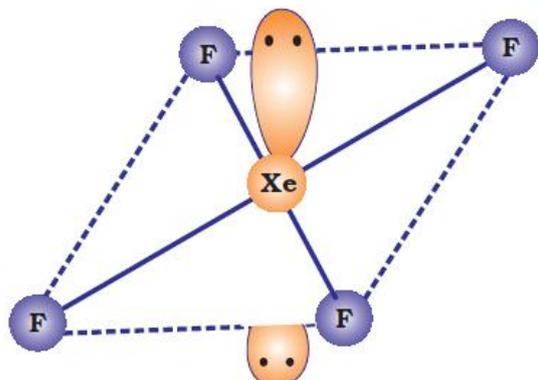
Qn	Value points	Marks
1	3-Methylbut-2-en-1-ol	1
2	Because of weak van der Waals' forces in physisorption whereas there are strong chemical forces in chemisorption.	1
3	CH ₃ CH ₂ I, because I is a better leaving group.	½, ½
4	Rhombic sulphur	1
5	X ₂ Y ₃	1
6	(i) CH ₃ MgBr/ H ₃ O ⁺ (ii) PCl ₅ / PCl ₃ / SOCl ₂	1 1
7	a) Cu ²⁺ (aq) + 2 e → Cu(s) because of high E ⁰ value/ more negative ΔG b) It states that limiting molar conductivity of an electrolyte is equal to the sum of the individual contributions of cations and anions of the electrolyte. It is used to calculate the Λ _m ⁰ for weak electrolyte / It is used to calculate α and K _c (Any one application)	½, ½ 1 1
8	When solute- solvent interaction is stronger than pure solvent or solute interaction. Eg: chloroform and acetone (or any other correct eg) Δ _{mix} H= negative OR	1 ½ ½
8	Azeotropes –binary mixtures having same composition in liquid and vapour phase and boil at constant temperature / is a liquid mixture which distills at constant temperature without undergoing change in composition Maximum boiling azeotropes eg: HNO ₃ (68%) and H ₂ O(32%) (or any other correct example)	1 ½ ½
9	a) Due to presence of unpaired d-electrons/ comparable energies of 3d and 4s orbitals. b) Mn, due to involvement of 4s and 3d electrons/ presence of maximum unpaired d-electrons.	1 ½, ½

16	$d = \frac{Z \times M}{N_A \times a^3}$ $6.23 \text{ g cm}^{-3} = \frac{z \times 60 \text{ g/mol}}{6.022 \times 10^{23} \text{ mol}^{-1} \times (4 \times 10^{-8} \text{ cm})^3}$ <p>$z=4$ fcc</p>	<p>1/2</p> <p>1/2</p> <p>1</p> <p>1</p>
17	$\Delta T_f = i \cdot K_f \cdot m$ $= i \cdot K_f \cdot \frac{w_B \times 1000}{M_B \times w_A}$ $2K = \frac{2 \times 1.86K \text{ kg/mol} \times w_B \times 1000}{58.5 \text{ g/mol} \times 37.2 \text{ g}}$ $w_B = 1.17\text{g}$	<p>1</p> <p>1</p> <p>1</p>
18	<p>$n \text{ HOH}_2\text{C} - \text{CH}_2\text{OH} + n \text{ HOOC} - \text{C}_6\text{H}_4 - \text{COOH}$</p> <p>Ethylene glycol (Ethane-1, 2 - diol) Terephthalic acid (Benzene-1,4 - di carboxylic acid)</p> <p>i)</p> <p> + CH_2O</p> <p>ii) Phenol and formaldehyde</p> <p>$\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$ $\text{C}_6\text{H}_5\text{CH} = \text{CH}_2$</p> <p>1, 3-Butadiene Styrene</p> <p>iii)</p> <p>(Note: half mark for structure/s and half mark for name/s)</p>	<p>1</p> <p>1</p> <p>1</p>
19	<p>a) Because they are unable to form H-bonds with water molecules.</p> <p>b) Because of the presence of chiral carbon in butan-2-ol.</p> <p>c) Due to dominating +R effect</p>	<p>1</p> <p>1</p> <p>1</p>
20	<p>i) $\text{C}_6\text{H}_5\text{COOH} \xrightarrow{\text{PCl}_5} \text{C}_6\text{H}_5\text{COCl} \xrightarrow[\text{BaSO}_4]{\text{H}_2/\text{Pd}} \text{C}_6\text{H}_5\text{CHO}$</p> <p>ii) $\text{CH}\equiv\text{CH} + \text{H}_2\text{O} \xrightarrow{\text{Hg}^{2+}/\text{H}_2\text{SO}_4} \text{CH}_3\text{CHO}$</p> <p>iii) $\text{CH}_3\text{COOH} \xrightarrow{\text{NaOH}} \text{CH}_3\text{COONa} \xrightarrow{\text{NaOH} + \text{CaO, heat}} \text{CH}_4$</p> <p style="text-align: center;">OR</p>	<p>1</p> <p>1</p> <p>1</p>

20	<p>i) $\text{RCN} + \text{SnCl}_2 + \text{HCl} \longrightarrow \text{RCH} = \text{NH} \xrightarrow{\text{H}_3\text{O}^+} \text{RCHO}$</p> <p>ii) $\text{>C=O} \xrightarrow[-\text{H}_2\text{O}]{\text{NH}_2\text{NH}_2} \text{>C=NNH}_2 \xrightarrow[\text{heat}]{\text{KOH/ethylene glycol}} \text{>CH}_2 + \text{N}_2$</p> <p>iii) </p>	1 1 1
21	<p>i) Fructose</p> <p>ii) Acidic amino acid has more number of acidic carboxylic group than basic amino group whereas basic amino acid has more number of basic amino group.</p> <p>iii) Vitamin C</p>	1 1 1
22	<p>a) Impure Ni reacts with CO to form volatile Ni(CO)₄ which when heated at higher temperature decomposes to give pure Ni.</p> <p>b) NaCN acts as a leaching agent to form a soluble complex with gold.</p> <p>c) It is a mixture of Cu₂S and FeS</p>	1 1 1
23	<p>a) Concern for students health, Application of knowledge of chemistry to daily life, empathy, caring or any other</p> <p>b) Through posters, nukkad natak in community, social media, play in assembly (or any other relevant answer)</p> <p>c) Wrong choice and overdose may be harmful</p> <p>d) Aspartame, saccharin (or any other correct example)</p>	½, ½ 1 1 ½+ ½
24	<p>a) i) Because of lone pair in NH₃, lone pair- bond pair repulsion decreases the bond angle</p> <p>ii) Because of absence of H-bonding in H₂S</p> <p>iii) Because stability of +4 oxidation state increases from SO₂ to TeO₂</p> <p>b)  $\text{H}_4\text{P}_2\text{O}_7$</p> <p></p>	1 1 1 1,1

24

OR



a)

b)i) Because iron on reaction with HCl produces $H_2(g)$ which prevents the formation of $FeCl_2$ to $FeCl_3$ / Because HCl is a weak oxidising agent.

ii) Because of higher oxidation state of chlorine in $HClO_4$

iii) Because of lower dissociation enthalpy of Bi-H bond.

1,1

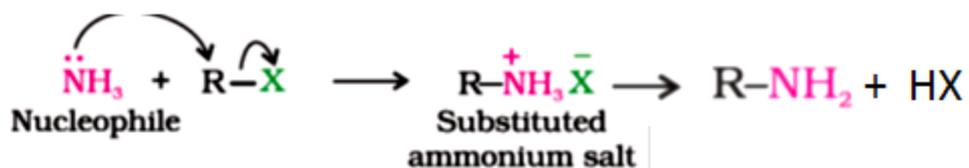
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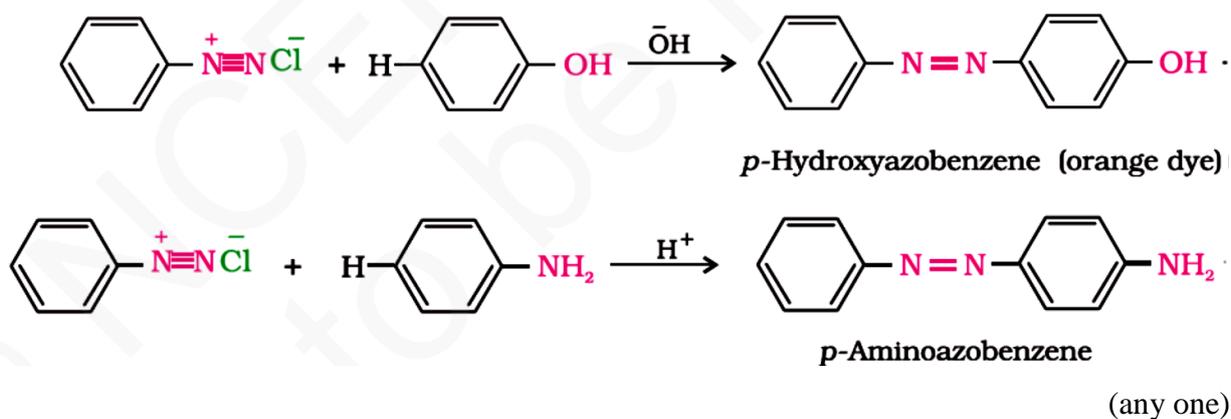
25

a) i) ammonolysis

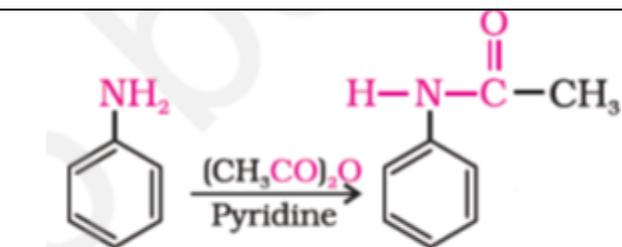


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ii)

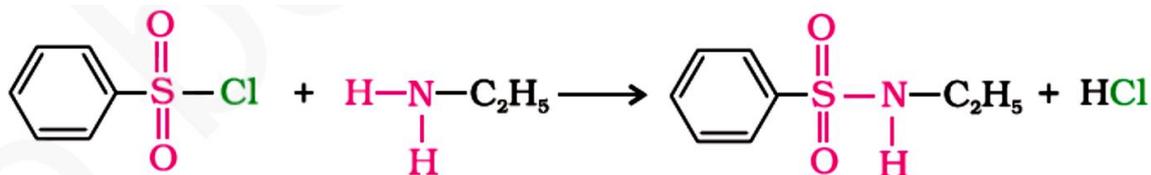


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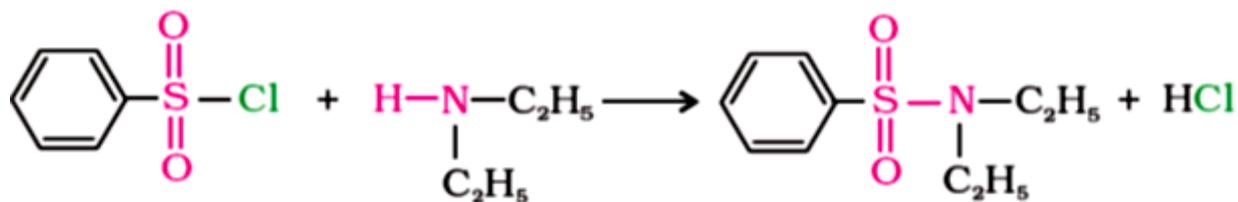
(or any other correct reaction)

b) reaction of primary amine



(soluble in alkali)

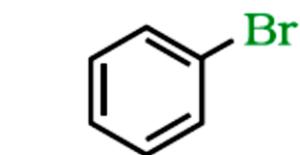
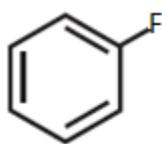
Reaction of secondary amine



(insoluble in alkali)

Tertiary amine doesn't react

OR



25

1

1

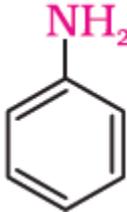
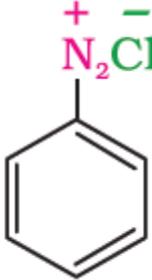
1

1

1

1/2, 1/2,

1/2

	<p>b) i) A-  B-  C- </p> <p>ii) A- CH₃CN B- CH₃CH₂NH₂ C- CH₃CH₂OH</p>	<p>1/2, 1/2, 1/2</p>
26	<p>a)i) Activation energy- Extra energy required by reactants to form activated complex. ii) Rate constant- rate of reaction when the concentration of reactant is unity.</p> <p>b)</p> $k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}$ $k = \frac{2.303}{10 \text{ min}} \log \frac{100}{75}$ $k = \frac{2.303 \times 0.125}{10 \text{ min}}$ $k = 0.02879 \text{ min}^{-1}$ $t_{1/2} = \frac{0.693}{k} = \frac{0.693}{0.02879 \text{ min}^{-1}}$ $t_{1/2} = 24.07 \text{ min}$ <p style="text-align: center;">OR</p> <p>a) i) First order ii) -k iii) s⁻¹</p> <p>b)</p> $t = \frac{2.303}{k} \log \frac{[R]_0}{[R]}$ $t_{99\%} = \frac{2.303}{k} \log \frac{100}{1}$ $t = \frac{2.303}{k} \times 2$	<p>1 1 1/2 1/2 1 1 1 1,1,1 1/2</p>
26		

