

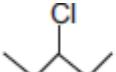
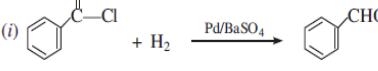
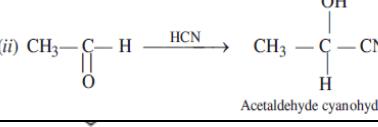
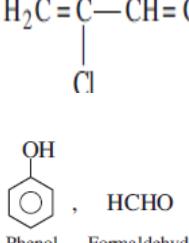
INDIAN SCHOOL MUSCAT

**FIRST PRELIMINARY EXAMINATION**  
**JANUARY 2019**

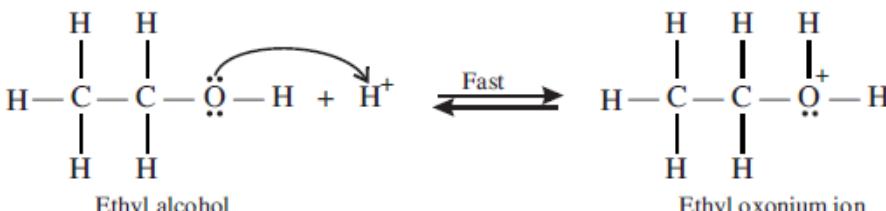
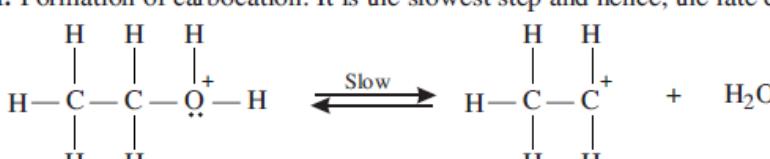
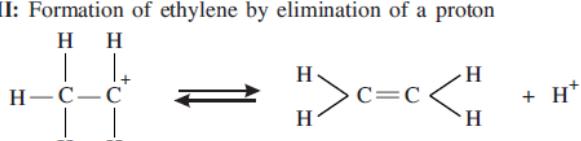
## **SET A**

CLASS XII

## **Marking Scheme – SUBJECT [THEORY]**

Q.NO.	Answers	Marks (with split up)
1.	 Secondary alkyl halide	½ each
2.	One cation of higher valence replaces two cations of lower valence and generates a cation vacancy	1
3.	Buna-S, Nylon-6,6, Bakelite	1
4.	Dichloridobis(ethane-1,2-diamine)iron(III)chloride OR Definition	1
5.	Conversion of precipitate into colloid using dispersion medium and a suitable peptizing agent OR Decrease in surface energy appears as heat	1
6.	a) Conc nitric acid b) Methyl chloride with anhy. $\text{AlCl}_3$	1 1
7.	(i)  (ii)  Acetaldehyde cyanohydrin	1 1
8.		1 ½ each
9.	The elevation in boiling point when one mole of a non-volatile solute is added to 1000 grams of solvent	1

	polymers have low solubility and are unstable at high temperatures	1
10.	Structures	1 each
11.	a) $6\text{Fe}^{2+} + \text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ \rightarrow 2\text{Cr}^{3+} + 6\text{Fe}^{3+} + 7\text{H}_2\text{O}$ b) $8\text{MnO}_4^- + 3\text{S}_2\text{O}_3^{2-} + \text{H}_2\text{O} \rightarrow 8\text{MnO}_2 + 6\text{SO}_4^{2-} + 2\text{OH}^-$ OR $2\text{MnO}_2 + 4\text{KOH} + \text{O}_2 \rightarrow \text{K}_2\text{MnO}_4 + 2\text{H}_2\text{O}$ $3\text{MnO}_4^{2-} + 4\text{H}^+ \rightarrow 2\text{MnO}_4^- + \text{MnO}_2 + 2\text{H}_2\text{O}$	1 1 1 1
12.	$Kt = 2.303 \log \frac{[R]_0}{[R]} \Rightarrow t = t_{1/2}$ when $t = t_{1/2} \quad [R] = \frac{[R]_0}{2}$ $\therefore t_{1/2} = \frac{2.303}{K} \log \frac{[R]_0}{[R]_0/2} = \frac{2.303}{K} \log 2 = \frac{2.303}{K} \times 0.3010$ $\therefore t_{1/2} = \frac{0.693}{K}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
13.	$d = z \times M / a^3 \times N$ $= 4 \times 200 / (200 \times 10^{-8})^3 \times 24 \times 10^{23}$ $= 41.67 \text{ g cm}^{-3}$	1 each
14.	a) $[\text{Co}(\text{en})_3]^{3+}$ due to chelation b) Explanation c) $t_{2g}^4$	1 each
15.	a) $\text{C}_2\text{H}_5\text{Cl} + \text{AgF} \rightarrow \text{C}_2\text{H}_5\text{F} + \text{AgCl}$ b) $\text{C}_6\text{H}_5\text{Cl} + \text{CH}_3\text{COCl} \rightarrow \text{C}_6\text{H}_4(\text{Cl})(\text{CH}_3\text{CO})$ c) $\text{C}_6\text{H}_5\text{CH}_2\text{OH} + \text{SOCl}_2 \rightarrow \text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ OR i) Iodide is a better leaving group ii) Symmetry/ it fits into crystal lattice iii) Due to $+R$ they are e- rich and nucleophiles find it difficult to approach haloarenes	1 each
16.	$\Delta T_f = iK_f m$ $i = 1.62 \times 122 \times 25 / 4.9 \times 2 \times 1000 = 0.504$ $a = 99.2\%$	1 each
17.	a) Colloidal particles move towards respective electrode [electrophoresis] b) Tyndall effect/scattering of light by colloidal particles c) Precipitation/coagulation OR One difference each	1 each
18.	As entropy is more on the positive side when metal formed is in the liquid state, free energy becomes more negative and reduction becomes easier.	1

	$\text{Zr(s)} + 2\text{I}_2(\text{g}) \xrightarrow[870\text{K}]{\text{(impure)}} \text{ZrI}_4(\text{g})$ $\text{ZrI}_4(\text{g}) \xrightarrow[2075\text{ K}]{\text{Tungsten filament}} \text{Zr(s)} + 2\text{I}_2(\text{Pure})$	2
19.	<p>a) N-hexane  b) Oxime  c) Gluconic acid  OR  Difference between fibrous and globular  One example</p>	1each
20.	<p>a) Cimetidine acts as an antacid for relief from hyperacidity  b) Chloramphenicol is broad spectrum antibiotic that treats meningitis, typhoid etc  c) Aspirin is non-narcotic analgesic that relieves pain, reduces fever and has blood thinning property.</p>	1each
21.	<p>a) Due to stable <math>d^3</math> configuration hence loses e whereas Mn gains e to attain half-filled <math>d^5</math> configuration  b) Due to high hydration enthalpy of Cu(II)  c) Due to presence of unpaired electrons/partially filled d-orbitals</p>	1each
22.	$k=2.303/20 \log 100/75=0.0143\text{min}^{-1}$ $t=2.303/0.0143 \log 100/25=96.9\text{min}$ OR $k=2.303/100 \log 0.4/0.1=0.0138/\text{s}$	$1\frac{1}{2}$ $1\frac{1}{2}$ $1+1+1$
23.	<p><b>Step I:</b> Formation of protonated alcohols</p>  <p><b>Step II:</b> Formation of carbocation: It is the slowest step and hence, the rate determining step.</p>  <p><b>Step III:</b> Formation of ethylene by elimination of a proton</p> 	1each
24.	<p>a) Neutral ferric chloride test/aq. bicarbonate test  b) i)</p>	1each

	$\begin{array}{ccc} >\text{C=O} & + & 4[\text{H}] \\ \text{Aldehyde or} & & \xrightarrow{\text{Zn/conc. HCl}} \\ \text{C}_6\text{H}_6 & \xrightarrow{\text{Lactone}} & \begin{array}{c} >\text{CH}_2 \\ \text{Hydrocarbon} \end{array} \\ \text{C}_6\text{H}_6 \xrightarrow{\text{CO/HCl/AlCl}_3} \text{C}_6\text{H}_5\text{CHO} \end{array}$	
25.	a) i) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow \text{XeF}_6 + \text{O}_2$ ii) $6\text{NaOH}(\text{hot conc.}) + 3\text{Cl}_2 \rightarrow 5\text{NaCl} + \text{NaClO}_3 + 3\text{H}_2\text{O}$ b) i) due to greater P-H bonds ii) monoatomic/weak dispersion forces c) $\text{HClO}, \text{HClO}_2, \text{HClO}_3, \text{HClO}_4$ OR i) Equation + condition ii) interhalogen bonds are weak iii) a) rhombic S b) white P iv) $2\text{Fe}^{3+} + \text{SO}_2 + \text{H}_2\text{O} \rightarrow 2\text{Fe}^{2+} + \text{SO}_4^{2-} + 4\text{H}^+$	1 1 1 1 1 2 1 $\frac{1}{2}$ each 1
26	A-aniline, B-phenyl isocyanide, C-benzene diazonium chloride, D-azo dye <p style="text-align: center;"> <b>Benzene diazonium chloride</b>      <b>Phenol</b>      <b>p-Hydroxyazobenzene (Orange dye)</b> </p> OR a) Hoffmann b) $\text{C}_6\text{H}_5\text{NH}_2 \rightarrow \text{C}_6\text{H}_5\text{N}_2\text{Cl} \rightarrow \text{C}_6\text{H}_5\text{CN}$ [diazotization followed with CuCN] c) A- $\text{C}_6\text{H}_5\text{NH}_2$ , B- $\text{C}_6\text{H}_5\text{N}_2\text{Cl}$ , C- $\text{C}_6\text{H}_5\text{OH}$ A - $\text{CH}_3\text{CH}_2\text{CN}$ , B- $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ , C- $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$	1each
27	a) Mercury cell reaction at anode + cathode b) $M = 108 \times 2 \times 600 / 1 \times 96500 = 1.34\text{g}$ c) $E_{\text{cell}} = 2.71 - 0.0591/2 \times \log 2 = 2.70\text{V}$ OR i) Statement + application $E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{0.0591}{2} \log \frac{[\text{Cu}^{2+}]}{[\text{Ag}^+]^2}$ $0.422 = 0.46 - \frac{0.0591}{2} \log \frac{[0.10]}{[\text{Ag}^+]^2}$ $[\text{Ag}^+]^2 = 0.0051$ $[\text{Ag}^+] = 7.1 \times 10^{-2} \text{ M}$	1 1 $1\frac{1}{2}$ $1\frac{1}{2}$ 2 3