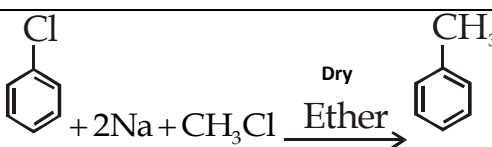
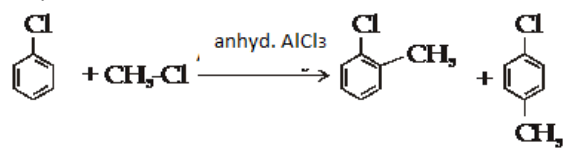
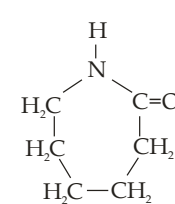


CHEMISTRY MARKING SCHEME 2016
SET - 56/2/E

[illegible]

	oxidation of ketones involve cleavage of C-C bond which is stronger than C-H bond. iii. Due to greater resonance stabilization / Because of greater electronegativity of sp^2 hybridised carbon to which carboxyl carbon is attached.	1
16	$K = \frac{2.303}{t} \log \frac{P_0}{2P_0 - Pt}$ $= \frac{2.303}{300} \log \frac{0.30}{2 \times 0.30 - 0.50}$ $= 0.0036 \text{ s}^{-1} / 3.6 \times 10^{-3} \text{ s}^{-1}$	1 1 1
17	(i) (A): $\text{C}_6\text{H}_5-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^- \text{NH}_4^+$, (B): $\text{C}_6\text{H}_5-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$, (C): $\text{C}_6\text{H}_5\text{NH}_2$ (ii) (A): $\text{C}_6\text{H}_5\text{NH}_2$, (B): $\text{C}_6\text{H}_5\text{N}_2\text{Cl}^+$, (C): $\text{C}_6\text{H}_5\text{CN}$	$\frac{1}{2} \times 3$ $\frac{1}{2} \times 3$
18	i. Due to greater angular strain of white phosphorus whereas red phosphorus has polymeric structure. ii. Due to stronger S-S single bond than O-O single bond. iii. Due to absence of d-orbital in Fluorine.	1 1 1
19	$\Delta T_f = i \times k_f \times m$ $\Delta T_f = i \times k_f \times \frac{w_B}{M_B} \times \frac{1000}{w_A}$ $\Delta T_f = 3 \times 1.86 \times \frac{3}{111} \times \frac{1000}{100}$ $\Delta T_f = 1.50 \text{ K}$ $\Delta T_f = T_f^0 - T_f$ $T_f = T_f^0 - \Delta T_f$ $= 273 - 1.5 / 273.15 - 1.50$ $= 271.5 \text{ K} / 271.65 \text{ K}$	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$
20	In bcc, $z = 2$ $d = \frac{Z \times M}{a^3 \times N_0} \dots (i)$ $\text{No of atoms} = \frac{W}{M} \times N_0$ $2.5 \times 10^{24} = \frac{250}{M} \times N_0$	$\frac{1}{2}$

	$M = \frac{250 \times N_0}{2.5 \times 10^{24}} \dots (ii)$ Putting the value of M in equation (i) $d = \frac{2 \times 250g \times N_0}{2.5 \times 10^{24} \text{ atoms} \times (400 \times 10^{-10} \text{ cm})^3} \times \frac{1}{N_0}$ $d = 3.125 \text{ g/cm}^3$ (or any other correct method)	1 1/2 1
21	i.  ii. $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2 \xrightarrow{\text{HBr}} \text{CH}_3 - \text{CH}_2 - \underset{\text{Br}}{\text{CH}} - \text{CH}_3 \xrightarrow{(\text{alc.}) \text{KOH}} \text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$ iii. $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Red P/I}_2} \text{C}_2\text{H}_5\text{I}$ (or any other correct method)	1 1 1
	OR	
21	i. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Cl} + \text{alc.KOH} \longrightarrow \text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2 / \text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$ ii. $2\text{CH}_3 - \underset{\text{Cl}}{\text{CH}} - \text{CH}_3 + 2\text{Na} \xrightarrow[\text{ether}]{\text{dry}} \text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3$ iii. 	1 1 1
22	i. 1, 3 butadiene + styrene $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2 + \text{C}_6\text{H}_5\text{CH} = \text{CH}_2$ ii. Ethylene glycol + Terephthalic acid $\text{HOCH}_2 - \text{CH}_2\text{OH} + \text{HOOC} - \text{C}_6\text{H}_4 - \text{COOH}$ iii. Caprolactum  (Note : Half marks for structure(s) and half mark for name(s))	1 1 1

23	(i) Caring nature, supportive, aware (any other two suitable values) (ii) Antacids are the medicines used to control acidity in stomach. Ex – mixture of aluminium and magnesium hydroxide / sodium hydrogen carbonate / Zantac / Ranitidine (any other suitable example) (iii) No, Excessive antacid can make the stomach alkaline and trigger the production of more acids.	$\frac{1}{2} + \frac{1}{2}$ 1 + $\frac{1}{2}$ $\frac{1}{2} + 1$
24	a. (i) $C_6H_5OH + CH_3I$ (ii) $CH_3 - \overset{\overset{CH_3}{ }}{C} = CH_2$ (iii)  b. (i) $ \begin{array}{c} \text{OH} \\ \\ \text{C}_6\text{H}_5 \end{array} \xrightarrow{\text{CHCl}_3 + \text{aq NaOH}} \left[\begin{array}{c} \text{ONa} \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{CHCl}_2 \end{array} \right] \xrightarrow{\text{NaOH}} \begin{array}{c} \text{ONa} \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{CHO} \end{array} \xrightarrow{\text{H}^+} \begin{array}{c} \text{OH} \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{CHO} \end{array} $ (ii) $ \begin{array}{c} \text{OCH}_3 \\ \\ \text{C}_6\text{H}_5 \end{array} + \text{CH}_3\text{Cl} \xrightarrow[\text{CS}_2]{\text{Anhyd AlCl}_3} \begin{array}{c} \text{OCH}_3 \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{CH}_3 \end{array} + \begin{array}{c} \text{OCH}_3 \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{CH}_3 \end{array} $	1 1 1 1 1
	OR	
24	a. (i) $ \begin{array}{c} \text{OH} \\ \\ \text{C}_6\text{H}_5 \end{array} + \text{Conc. HNO}_3 \longrightarrow \begin{array}{c} \text{OH} \\ \\ \text{C}_6\text{H}_2(\text{NO}_2)_3 \end{array} $ (ii) $ \begin{array}{c} \text{OH} \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{COOH} \end{array} + (\text{CH}_3\text{CO})_2\text{O} \xrightarrow{\text{H}^+} \begin{array}{c} \text{OCOCH}_3 \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{COOH} \end{array} + \text{CH}_3\text{COOH} $ (iii) $C_2H_5Cl + NaOCH_3 \rightarrow C_2H_5OCH_3 + NaCl$	1 1 1

	b. (i) Heat both compounds with NaOH and I₂, Ethanol gives yellow ppt of iodoform. Phenol does not. (ii) Heat both compounds with NaOH and I₂, Propan-2ol gives yellow ppt of iodoform. 2-Methylpropan-2-ol does not. (any other suitable test)	1 1
25	a. $\Delta G^0 = -n F E^0_{\text{cell}}$ $\Delta G^0 = -6 \times 96500 \times 2.02$ $\Delta G^0 = -1169580 \text{ J/mol}$ $E^0_{\text{cell}} = \frac{0.059 \text{ V}}{n} \log K_c$ $\log K_c = \frac{2.02 \text{ V} \times 6}{0.059 \text{ V}}$ = 205.42 b. A, because its E⁰ value is more negative.	1/2 1 1/2 1 1+1
	OR	
25	(a) a. $\Lambda^c_m = \kappa \times 1000/C$ = $3.905 \times 10^{-5} \times 1000/0.001$ = $39.05 \text{ S cm}^2/\text{mole}$ $\text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COO}^- + \text{H}^+$ $\Lambda^0 \text{CH}_3\text{COOH} = \lambda^0 \text{CH}_3\text{COO}^- + \lambda^0 \text{H}^+$ = $349.6 + 40.9$ $\Lambda^0 \text{CH}_3\text{COOH} = 390.5 \text{ S cm}^2/\text{mol}$ $\alpha = \frac{\Lambda_m}{\Lambda^0_m}$ = $39.05/390.5$ = 0.1 b. Primary cell $\text{Zn} + 2\text{NH}_4^+ + 2\text{MnO}_2 \rightarrow \text{Zn}^{++} + 2\text{NH}_3 + 2\text{MnO}(\text{OH})$	1/2 1 1/2 1 1+1
26	a. (i) Due to higher oxidation state of Mn in Mn₂O₇. (ii) Due to Lanthanoid contraction. (iii) Due to availability of vacant d-orbitals. b. $2\text{MnO}_2 + 4\text{KOH} + \text{O}_2 \rightarrow 2\text{K}_2\text{MnO}_4 + 2\text{H}_2\text{O}$ KMnO₄ diamagnetic K₂MnO₄ paramagnetic.	1 1 1 1 1/2 1/2
	OR	

26	a. (i) High ionization enthalpy/Low hydration enthalpy. (ii) Cr, Cr²⁺ is oxidized to Cr³⁺ which has stable d³ / t_{2g}³ orbital configuration. (iii) Due to d¹⁰ configuration/no unpaired electrons. b. (i) $4\text{FeCr}_2\text{O}_4 + 8\text{Na}_2\text{CO}_3 + 7\text{O}_2 \rightarrow 8\text{Na}_2\text{CrO}_4 + 2\text{Fe}_2\text{O}_3 + 8\text{CO}_2$ (ii) $2\text{Na}_2\text{CrO}_4 + 2\text{H}^+ \rightarrow \text{Na}_2\text{Cr}_2\text{O}_7 + 2\text{Na}^+ + \text{H}_2\text{O}$	1 $\frac{1}{2} + \frac{1}{2}$ 1 1 1
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