

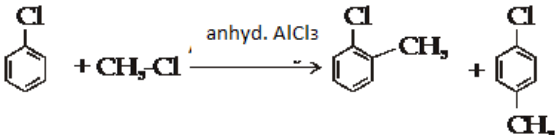
CHEMISTRY MARKING SCHEME 2016
SET - 56/1/E

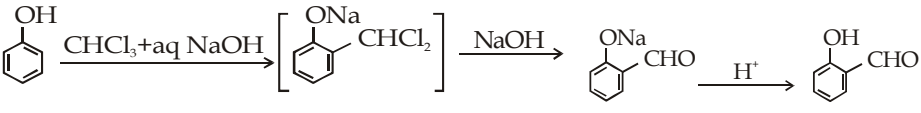
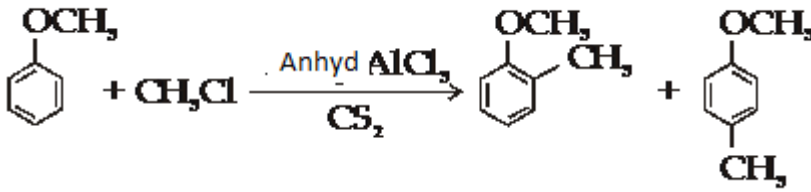
Ques.	Value points	Marks
1	(ii)	1
2	Like Charged particles cause repulsion/ Brownian motion/ solvation	1
3	SO ₂	1
4	Conductor / Metallic solid.	1
5	N-Phenylethanamide / Acetanilide	1
6	Positive deviation Observed vapour pressure is greater than expected vapour pressure. A-B interaction < A – A & B – B Negative deviation Observed vapour pressure is less than expected vapour pressure. A – B interaction > A – A & B – B (Any other correct differences)	1+1
7	(i) (ii)	1 1
8	X : CH ₃ -CO-CH ₂ -CH ₃ / Butan-2-one Y: CH ₃ -CH(OH)-CH ₂ -CH ₃ / Butan-2-ol	1 1
9	(i) [Pt(NH ₃) ₆]Cl ₄ (ii) Hexaammineplatinum (IV) chloride	1 1
10	t = $\frac{2.303}{k} \log \left[\frac{A_0}{[A]} \right]$ $t_{3/4} = \frac{2.303}{k} \log \left[\frac{A_0}{\frac{1}{4}[A_0]} \right]$ $t_{3/4} = \frac{2.303}{k} \log 4$(i)	½

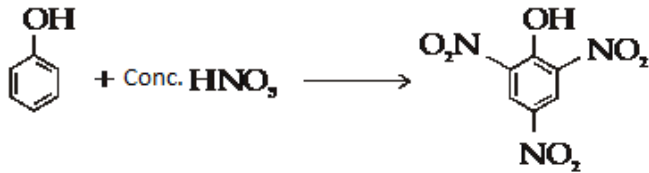
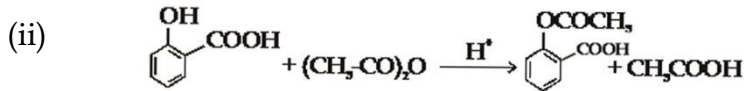
	$t_{1/2} = \frac{2.303}{k} \log \frac{[A_0]}{1/2 [A_0]}$ $t_{1/2} = \frac{2.303}{k} \log 2 \quad \dots\dots(ii)$ Divide equation (i) by (ii) $t_{3/4} = \frac{2.303}{k} \log 4$ $t_{1/2} = \frac{2.303}{k} \log 2$ $t_{3/4} = 2 t_{1/2}$	1/2 1
	OR	
10	For zero order reaction $R \longrightarrow P$ $\text{Rate} = -\frac{d[R]}{dt} = k[R]^0$ $d[R] = -kdt$ Integrating both sides $[R] = -kt + I$ At $t = 0$ $R = [R]_0$ Substituting in equation (i) $[R]_0 = -k \times 0 + I$ $[R]_0 = I \quad \dots (ii)$ Substituting the value of I in equation (i) $R = -kt + [R]_0$ $k = \frac{[R]_0 - [R]}{t}$	1/2 1/2 1/2 1/2
11	In bcc, $z = 2$ $d = \frac{Z \times M}{a^3 \times N_0} \quad \dots(i)$ No of atoms = $\frac{W}{M} \times N_0$ $2.5 \times 10^{24} = \frac{250}{M} \times N_0$ $M = \frac{250 \times N_0}{2.5 \times 10^{24}} \quad \dots (ii)$ 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)	1/2 1 1/2 1
12	i. Due to strong electron withdrawing effect of carbonyl group and	1

	resonance stabilization of the conjugate base. ii. Oxidation of aldehydes involves cleavage of C-H bond whereas 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 1
13	$K = \frac{2.303}{t} \log \frac{P_0}{2P_0 - Pt}$ $= \frac{2.303}{300} \log \frac{0.30}{2 \times 0.30 - 0.50}$ $= 0.0036 \text{ s}^{-1} / 3.6 \times 10^{-3} \text{ s}^{-1}$	1 1 1
14	(i) The process of converting freshly prepared precipitate into colloidal solution by shaking it with dispersion medium in the presence of a small amount of electrolyte. (ii) The Potential difference between the fixed layer and the diffused/double layer of opposite charges. (iii) Zig-zag movement / random motion.	1 1 1
15	i. The metal is converted into its volatile compound and finally decomposed to give pure metal . ii. The different components of a mixture are differently adsorbed on an adsorbent. iii. Mineral particles are wetted by oil and gangue particles by water.	1 1 1
16	$\Delta T_f = i \times k_f \times m$ $\Delta T_f = i \times k_f \times \frac{w_B}{M_B} \times \frac{1000}{w_A}$ $\Delta T_f = 3 \times 1.86 \times \frac{3}{111} \times \frac{1000}{100}$ $\Delta T_f = 1.50 \text{ K}$ $\Delta T_f = T_f^0 - T_f$ $T_f = T_f^0 - \Delta T_f$ $= 273 - 1.5 / 273.15 - 1.50$ $= 271.5 \text{ K} / 271.65 \text{ K}$	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$
17	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
18	(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): $\text{C}_6\text{H}_5\text{NH}_2$	$\frac{1}{2} \times 3$

	(ii) (A): $C_6H_5NH_2$, (B): $C_6H_5N_2Cl^+$, (C): C_6H_5CN	$\frac{1}{2} \times 3$
19	i. 1, 3 butadiene + styrene $CH_2=CH-CH=CH_2 + \begin{array}{c} CH=CH_2 \\ \\ \bigcirc \end{array}$ ii. Ethylene glycol + Terephthalic acid $HOCH_2-CH_2OH + HOOC-\bigcirc-COOH$ iii. Caprolactum $\begin{array}{c} H \\ \\ N \\ / \quad \backslash \\ H_2C \quad C=O \\ \quad \\ H_2C \quad CH_2 \\ \backslash \quad / \\ H_2C-CH_2 \end{array}$ (Note : Half marks for structure(s) and half mark for name(s))	1 1 1
20	(i) β D - galactose and β D-glucose/ galactose and glucose. (ii) Hydrogen bond. (iii) Nucleotide=Base+Sugar+Phosphate group Nucleoside=Base+Sugar	1 1 $\frac{1}{2}$ $\frac{1}{2}$
21	a. sp^3d^2 Paramagnetic High spin b. As (en) is bidentate chelating ligand & F^- is a monodentate ligand.	1 $\frac{1}{2}$ $\frac{1}{2}$ 1
22	i. $\begin{array}{c} Cl \\ \\ \bigcirc \end{array} + 2Na + CH_3Cl \xrightarrow[\text{Ether}]{\text{Dry}} \begin{array}{c} CH_3 \\ \\ \bigcirc \end{array}$ ii. $CH_3-CH_2-CH=CH_2 \xrightarrow{HBr} CH_3-CH_2-\underset{\substack{ \\ Br}}{CH}-CH_3 \xrightarrow{(alc.) KOH} CH_3-CH=CH-CH_3$ iii. $C_2H_5OH \xrightarrow{Red P/I_2} C_2H_5I$ (or any other correct method)	1 1 1
	OR	

22	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
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. $\Delta G^0 = -n F E^0_{\text{cell}}$ $\Delta G^0 = -6 \times 96500 \times 2.02$ $\Delta G^0 = -1169580 \text{ J/mol}$ $E^0_{\text{cell}} = \frac{0.059 \text{ V}}{n} \log K_c$ $\log K_c = \frac{2.02 \text{ V} \times 6}{0.059 \text{ V}}$ $= 205.42$ b. A, because its E^0 value is more negative.	$\frac{1}{2}$ 1 $\frac{1}{2}$ 1 1+1
OR		
24	(a) a. $\Lambda^c_m = \kappa \times 1000 / C$ $= 3.905 \times 10^{-5} \times 1000 / 0.001$ $= 39.05 \text{ S cm}^2/\text{mole}$ $\text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COO}^- + \text{H}^+$ $\Lambda^0 \text{CH}_3\text{COOH} = \Lambda^0 \text{CH}_3\text{COO}^- + \Lambda^0 \text{H}^+$ $= 349.6 + 40.9$ $\Lambda^0 \text{CH}_3\text{COOH} = 390.5 \text{ S cm}^2/\text{mol}$ $\alpha = \frac{\Lambda_m}{\Lambda^0_m}$ $= 39.05 / 390.5$ $= 0.1$	$\frac{1}{2}$ 1 $\frac{1}{2}$ 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+1
25	a. (i) Due to higher oxidation state of Mn in Mn_2O_7. (ii) Due to Lanthanoid contraction. (iii) Due to availability of vacant d-orbitals. b. $2\text{MnO}_2 + 4\text{KOH} + \text{O}_2 \rightarrow 2\text{K}_2\text{MnO}_4 + 2\text{H}_2\text{O}$ KMnO_4 diamagnetic K_2MnO_4 paramagnetic.	1 1 1 1 $\frac{1}{2}$ $\frac{1}{2}$
	OR	
25	a. (i) High ionization enthalpy/Low hydration enthalpy. (ii) Cr, Cr^{2+} is oxidized to Cr^{3+} which has stable d^3 / t_{2g}^3 orbital configuration. (iii) Due to d^{10} 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
26	a. (i) $\text{C}_6\text{H}_5\text{OH} + \text{CH}_3\text{I}$ (ii) $\text{CH}_3 - \overset{\text{CH}_3}{\underset{ }{\text{C}}} = \text{CH}_2$ (iii)  b. (i)  (ii) 	1 1 1 1 1

	OR	
26	a. (i)  (ii)  (iii) $C_2H_5Cl + NaOCH_3 \rightarrow C_2H_5OCH_3 + NaCl$ b. (i) Heat both compounds with NaOH and I_2, Ethanol gives yellow ppt of iodoform. Phenol does not. (ii) Heat both compounds with NaOH and I_2, Propan-2ol gives yellow ppt of iodoform. 2-Methylpropan-2-ol does not. (any other suitable test)	1 1 1 1 1

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Mr. K.M. Abdul Raheem		Ms. Minakshi Gupta	
Mrs. Sushma Sachdeva		Sh. Mukesh Kaushik	
Ms. Seema Bhatnagar		Mr. Roop Narayan	
Sh. Pawan Singh Meena		Ms. Garima Bhutani	
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