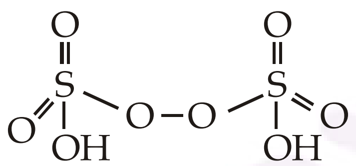
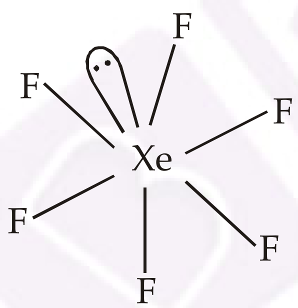
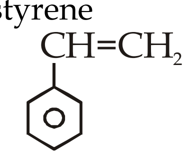
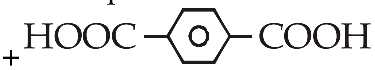
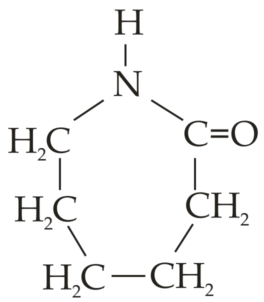
CHEMISTRY MARKING SCHEME 2016
SET - 56/1/E

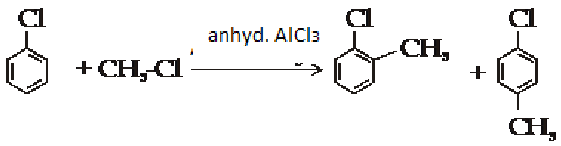
<table>
<tr><th>Ques.</th><th>Value points</th><th>Marks</th></tr>
<tr><td>1</td><td>(ii)</td><td>1</td></tr>
<tr><td>2</td><td>Like Charged particles cause repulsion/ Brownian motion/ solvation</td><td>1</td></tr>
<tr><td>3</td><td>SO_2</td><td>1</td></tr>
<tr><td>4</td><td>Conductor / Metallic solid.</td><td>1</td></tr>
<tr><td>5</td><td>N-Phenylethanamide / Acetanilide</td><td>1</td></tr>
<tr><td>6</td><td><table>
<tr><th>Positive deviation</th><th>Negative deviation</th></tr>
<tr><td>Observed vapour pressure is greater than expected vapour pressure.</td><td>Observed vapour pressure is less than expected vapour pressure.</td></tr>
<tr><td>A-B interaction $<$ A – A & B – B</td><td>A – B interaction $>$ A – A & B – B</td></tr>
<tr><td colspan="2">(Any other correct differences)</td></tr>
</table></td><td>1+1</td></tr>
<tr><td>7</td><td>(i)

(ii)

</td><td>1

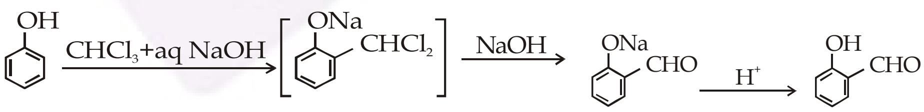
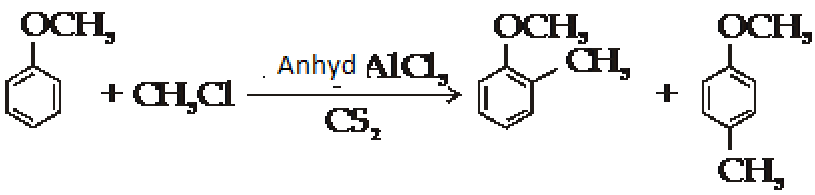
1</td></tr>
<tr><td>8</td><td>X : CH_3-CO-CH_2-CH_3 / Butan-2-one
Y: CH_3-CH(OH)-CH_2-CH_3 / Butan-2-ol</td><td>1
1</td></tr>
<tr><td>9</td><td>(i) $[Pt(NH_3)_6]Cl_4$
(ii) Hexaammineplatinum (IV) chloride</td><td>1
1</td></tr>
<tr><td>10</td><td>$t = \frac{2.303}{k} \log \frac{[A_0]}{[A]}$
$t_{3/4} = \frac{2.303}{k} \log \frac{[A_0]}{1/4[A_0]}$
$t_{3/4} = \frac{2.303}{k} \log 4$ ……….(i)</td><td>½</td></tr>
</table>

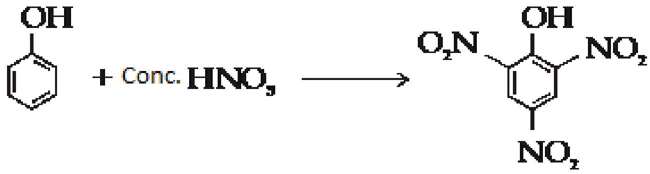
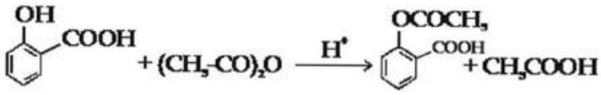
	$t_{1/2} = \frac{2.303}{k} \log \frac{[A_0]}{1/2\,[A_0]}$ $t_{1/2} = \frac{2.303}{k} \log 2$ ....(ii) Divide equation (i) by (ii) $\frac{t_{3/4} = \frac{2.303}{k} \log 4}{t_{1/2} = \frac{2.303}{k} \log 2}$ $t_{3/4} = 2\ t_{1/2}$	½ 1
	OR	
10	For zero order reaction $R \longrightarrow P$ Rate = $-\frac{d[R]}{dt} = k[R]^0$ $d[R] = -kdt$ Integrating both sides $[R] = -kt + I$ ...... (i) At $t = 0 \quad R = [R]_0$ Substituting in equation (i) $[R]_0 = -k \times 0 + I$ $[R]_0 = I$ .... (ii) Substituting the value of I in equation (i) $R = -kt + [R]_0$ $k = \frac{[R]_0 - [R]}{t}$	½ ½ ½ ½
11	In bcc , z = 2 d = $\frac{Z \times M}{a^3 \times N_0}$ ....(i) No of atoms = $\frac{W}{M} \times N_0$ $2.5 \times 10^{24} = \frac{250}{M} \times N_0$ M = $\frac{250 \times N_0}{2.5 \times 10^{24}}$ .... (ii) Putting the value of M in equation (i) d = $\frac{2 \times 250g \times N_0}{2.5 \times 10^{24} atoms \times (400 \times 10^{-10} cm)^3} \times \frac{1}{N_0}$ d = $3.125\ g/cm^3$ (or any other correct method)	½ 1 ½ 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	$K = \frac{2.303}{t} \log \frac{P_0}{2P_0 - Pt}$ $= \frac{2.303}{300} \log \frac{0.30}{2 \times 0.30 - 0.50}$ $= 0.0036\ s^{-1}$ / $3.6 \times 10^{-3} s^{-1}$	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	$\Delta T_f = i \times k_f \times m$ $\Delta T_f = i \times k_f \times \frac{w_B}{M_B} \times \frac{1000}{w_A}$ $\Delta T_f = 3 \times 1.86 \times \frac{3}{111} \times \frac{1000}{100}$ $\Delta T_f = 1.50 k$ $\Delta T_f = T^0{}_f - T_f$ $T_f = T^0{}_f - \Delta T_f$ $= 273 - 1.5$ / $273.15 - 1.50$ $= 271.5$ K / 271.65 K	½ ½ 1 ½ ½
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) : $C_6H_5-C(=O)-O^- \ NH_4^+$, (B) : $C_6H_5-C(=O)-NH_2$, (C): $C_6H_5NH_2$	½×3

	(ii) (A) : $C_6H_5NH_2$, (B): $C_6H_5\overset{+}{N}_2\overset{-}{Cl}$, (C): C_6H_5CN	½×3
19	i. 1, 3 butadiene + styrene $CH_2=CH-CH=CH_2$ +  ii. Ethylene glycol + Terephthalic acid $HOCH_2-CH_2OH$ +  iii. Caprolactum  (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 ½ ½
21	a. sp^3d^2 Paramagnetic High spin b. As (en) is bidentate chelating ligand & F^- is a monodentate ligand.	1 1/2 1/2 1
22	i.  ii. $CH_3-CH_2-CH=CH_2 \xrightarrow{HBr} CH_3-CH_2-CH(Br)-CH_3 \xrightarrow{(alc.)\,KOH} CH_3-CH=CH-CH_3$ iii. $C_2H_5OH \xrightarrow{Red\ P/I_2} C_2H_5I$ **(or any other correct method)**	1 1 1
	OR	

22	i. $CH_3-CH_2-CH_2-CH_2-Cl + alc.KOH \longrightarrow CH_3-CH_2-CH=CH_2 / CH_3-CH=CH-CH_3$	1
	ii. $2CH_3-\underset{\displaystyle Cl}{\underset{\vert}{CH}}-CH_3 + 2Na \xrightarrow[ether]{dry} CH_3-\underset{\displaystyle CH_3}{\underset{\vert}{CH}}-\underset{\displaystyle CH_3}{\underset{\vert}{CH}}-CH_3$	1
	iii.  	1
23	(i) Caring nature, supportive, aware (any other two suitable values)	½ + ½
	(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)	1+ ½
	(iii) No, Excessive antacid can make the stomach alkaline and trigger the production of more acids.	½ + 1
24	a. $\Delta G^0 = -nFE^0_{cell}$	½
	$\Delta G^0 = -6\times96500\times2.02$ $\Delta G^0 = -1169580 J/mol$	1
	$E^0_{cell} = \frac{0.059V}{n}\log K_c$	½
	$\log K_c = \frac{2.02V\times6}{0.059V}$ $= 205.42$	1
	b. A , because its E^0 value is more negative.	1+1
	OR	
24	**(a)** a. $\Lambda^c_m = \kappa \times 1000/C$	½
	$= 3.905 \times 10^{-5} \times 1000/0.001$ $= 39.05\ S\ cm^2/mole$	1
	$CH_3COOH \rightarrow CH_3COO^- + H^+$ $\Lambda^0\ CH_3COOH = \lambda^0\ CH_3COO^- + \lambda^0\ H^+$ $= 349.6 + 40.9$ $\Lambda^0\ CH_3COOH = 390.5\ S\ cm^2/mol$	
	$\alpha = \frac{\Lambda_m}{\Lambda^0_m}$	½
	$= 39.05/390.5$ $= 0.1$	1

	b. Primary cell $Zn + 2NH_4^+ + 2MnO_2 \rightarrow Zn^{++} + 2NH_3 + 2MnO(OH)$	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. $2MnO_2 + 4KOH + O_2 \rightarrow 2K_2MnO_4 + 2H_2O$ $KMnO_4$ diamagnetic K_2MnO_4 paramagnetic.	1 1 1 1 ½ ½
	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^3_{2g} orbital configuration. (iii) Due to d^{10} configuration/no unpaired electrons. b. (i) $4FeCr_2O_4 + 8Na_2CO_3 + 7O_2 \rightarrow 8Na_2CrO_4 + 2Fe_2O_3 + 8CO_2$ (ii) $2Na_2CrO_4 + 2H^+ \rightarrow Na_2Cr_2O_7 + 2Na^+ + H_2O$	1 ½ + ½ 1 1 1
26	a. (i) $C_6H_5OH + CH_3I$ (ii) $CH_3-C(CH_3)=CH_2$ (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