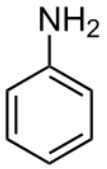
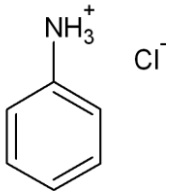
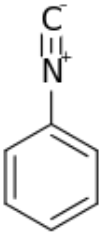
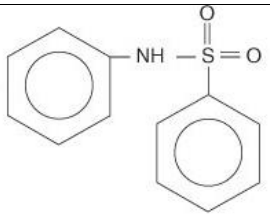
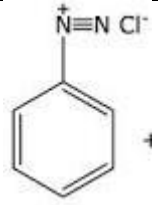
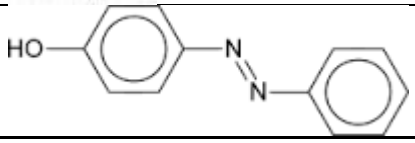
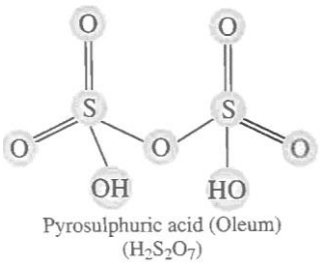
MARKING SCHEME

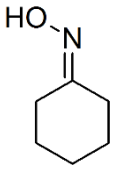
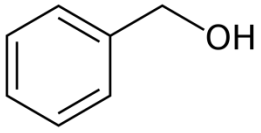
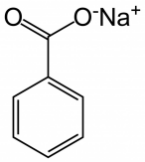
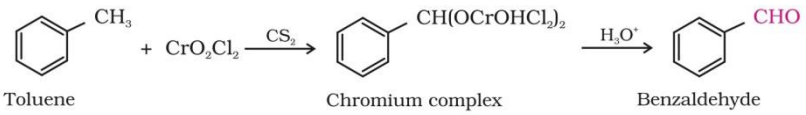
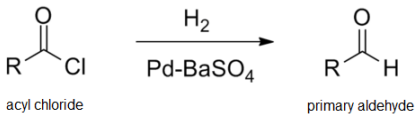
1	No α H is present	1
2	Ethanol will be converted into ethanoic acid.	1
3	$[Cr(H_2O)_4Cl_2]Cl$ Tetraaquadichloridochromium(III) chloride	½ + ½
4	The Brownian movement has a stirring effect, which does not allow the particles to settle.	1
5	$e^{-E_a/RT}$ Corresponds to the fraction of molecules that have kinetic energy greater than E_a.	1
6	(i) Vinyl chloride does not respond to NaOH and silver nitrate test because of partial double bond character due to resonance. (ii) Hydride ion / H^-	1 1
7	0.05 M $Al_2(SO_4)_3$ has higher freezing point. 0.05 M $Al_2(SO_4)_3$: i = 5, $\Delta T_f \propto$ No of particles ; ΔT_f = i x concentration = 5 x 0.05 = 0.25 moles of ions 0.1 M $K_3[Fe(CN)_6]$: i = 4, = 4 x 0.1 = 0.4 moles of ions	1 ½ ½
8	$2Cr(s) + 3Fe^{2+}(aq.) \rightarrow 3\ Fe\ (s) + 2\ Cr^{3+}\ (aq.)$ n = 6 $E_{Cell} = E^0_{Cell} - \frac{2.303RT}{nF}\log\frac{[Cr^{3+}]^2}{[Fe^{2+}]^3}$ $E_{Cell} = 0.30 - \frac{0.059}{6}\log\frac{[10^{-1}]^2}{[10^{-2}]^3}$ E_{Cell} = 0.26 V OR $\wedge_m = \frac{1000\kappa}{C}$ $\wedge_m = \frac{1000\ x\ 4.1x10^{-5}}{10^{-3}}$ = 41 S cm^2 mol^{-1} $\alpha = \frac{\wedge_m^c}{\wedge_m^0}$ $\alpha = \frac{41}{390.5}$ = 0.105	½ ½ ½ ½ ½ ½ ½ ½
9	(i) Orthophosphorus acid on heating disproportionates to give orthophosphoric acid and phosphine gas.	1

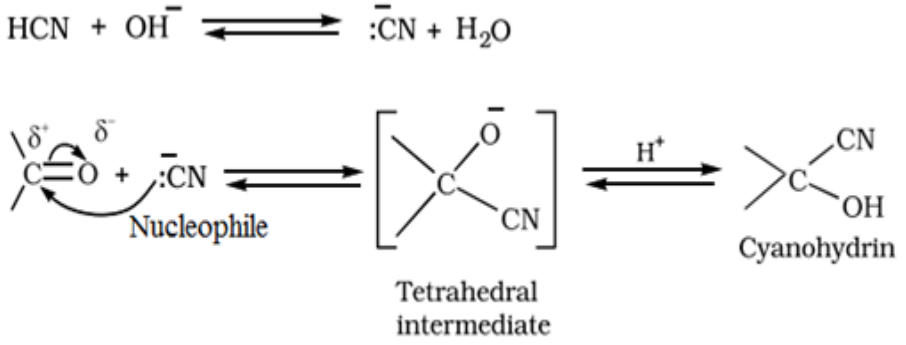
	$4H_3PO_3 \xrightarrow{heat} PH_3 + 3H_3PO_4$ (ii) When XeF_6 undrgoes complete hydrolysis,it forms XeO_3. $XeF_6 + 3H_2O \rightarrow 6HF + XeO_3$	1
10	(i) $Cr_2O_7^{2-}$ (ii) Cerium	1 1
11	(i) 2,5-Dimethylhexane. (ii)1-Methyl-1-iodocyclohexane. (iii) Nitroethane.	1+1+1
12	$\Delta T_f = i K_f m$ $2.12 = i \frac{5.12 x 2.5 x 1000}{122 \ x 25}$ i= 0.505 for association $i = 1 - \frac{\alpha}{2}$ α = 0.99 Percentage association of benzoic acid is 99.0%	½ 1 ½ ½ ½
13	(i) Because of H-bond formation between alcohol and water molecule. (ii) Nitro being the electron withdrawing group stabilises the phenoxide ion. (iii) side product formed in this reaction is acetone which is another important organic compound.	1+1+1
14	$t = \frac{2.303}{k} \log \frac{[R]_0}{[R]}$ $t = \frac{2.303}{60} \log \frac{1}{0.0625}$ t = 0.0462 s	1 1 1
15	(i) 'B' is a strong electrolyte. A strong electrolyte is already dissociated into ions, but on dilution interionic forces are overcome, ions are free to move. So there is slight increase in molar conductivity on dilution. (ii) On anode water should get oxidised in preference to Cl^-, but due to overvoltage/ overpotential Cl^- is oxidised in preference to water.	1 1 1
16	(i) $\frac{x}{m} = kC^{1/n}$ (ii) The charge on the sol particles is due to • Electron capture by sol particles during electrodispersion. • Preferential adsorption of ions from solution. • Formulation of electrical double layer. (any one reason) (iii) Molybdenum acts as a promoter for iron.	1 1 1

<table>
<tr><td>17</td><td><table>
<tr><td>A</td><td>  </td></tr>
<tr><td>B</td><td>  </td></tr>
<tr><td>C</td><td>  </td></tr>
<tr><td>D</td><td>  </td></tr>
<tr><td>E</td><td>  </td></tr>
<tr><td>F</td><td>  </td></tr>
</table></td><td>½ each</td></tr>
<tr><td>18</td><td>(i) Vitamin D.
(ii) Uracil.
(iii) 5 OH groups are present.</td><td>1
1
1</td></tr>
<tr><td>19</td><td>(i) Addition
(ii) Condensation/Hydrolysis
(iii) Condensation</td><td>1
1
1</td></tr>
<tr><td>20</td><td>(i) Gold is leached with a dilute solution of NaCN in the presence of air
(ii) Cryolite lowers the high melting point of alumina and makes it a good conductor of electricity.
(iii) CO forms a volatile complex with metal Nickel which is further decomposed to give pure Ni metal.</td><td>1
1

1</td></tr>
</table>

21	(i) $t_{2g}^4 e_g^0$ (ii) sp^3d^2 (iii) optical isomerism	1 1 1
22	(i) Cr^{2+} (ii) Sc^{3+} (iii) Sc^{3+} **OR** (i) The high energy to transform Cu(s) to Cu^{2+}(aq) is not balanced by its hydration enthalpy. (ii) Mn^{2+} has d^5 configuration(stable half-filled configuration) (iii) d^4 to d^3 occurs in case of Cr^{2+} to Cr^{3+}. (More stable t_{2g}^3) while it changes from d^6 to d^5 in case of Fe^{2+} to Fe^{3+}.	1 1 1
23	(i) Equanil, Iproniazid, phenelzine(any two) (ii) empathetic, caring, sensitive or any two values can be given. (iii)They should talk to him, be a patient listener, can discuss the matter with the psychologist. (iv)If the level of noradrenaline is low, then the signal sending activity becomes low and the person suffers from depression.	½+½ ½ +½ 1 1
24	(a) (i) $I_2 < F_2 < Br_2 < Cl_2$ (ii) $H_2O < H_2S < H_2Se < H_2Te$ (b) Gas A is Ammonia / NH_3 (i) $Cu^{2+}(aq) + 4\ NH_3\ (aq) \rightleftharpoons [Cu(NH_3)_4]^{2+}\ (aq)$ (ii) $ZnSO_4(aq) + 2NH_4OH(aq) \rightarrow Zn(OH)_2(s) + (NH_4)_2SO_4(aq)$ **OR** (a) **ClF** (b)  Pyrosulphuric acid (Oleum) ($H_2S_2O_7$) (c) N_2O_4 (d) Bleaching action of chlorine is due to oxidation. $Cl_2 + H_2O \rightarrow 2HCl + [O]$ (e) $3HNO_2 \rightarrow HNO_3 + H_2O + 2NO$	1 1 1 1 1 1 1 1 ½ ½ 1

25	(i)  (ii)  + 	1 ½ +½
	(iii) Cl-CH_2-COOH	1
	B(I) $NaHCO_3$ test.	1
	(ii) Iodoform test./Fehling's Test/ Tollen's Tesst	1
	OR	
	A (i) steric and electronic factor. (ii) Inductive effect decreases with distance and hence the conjugate base of 2-Fluorobutanoic acid is more stable.	½+½1
	b) i)	
	 Toluene Chromium complex Benzaldehyde	1
	(ii)  acyl chloride primary aldehyde	1
	(c)	1



26	(i)	Ferrimagnetism.	1
		These substances lose ferrimagnetism on heating and become paramagnetic.	1
	(ii)	r = 0.414 R	1
	(iii)	$r = \frac{\sqrt{3}}{4} a$	1
		$r = \frac{\sqrt{3}}{4} \; x \; 316.5$	½
		r = 136.88 pm	½
		OR	
	(i)	Schottky defect	1
		It is shown by ionic substances in which the cation and anion are of almost similar sizes.	1
	(ii)	$r = \frac{\sqrt{3}}{4} a$	1
	(iii)	$\rho = \frac{z M}{a^3 N_A}$	½
		$8.92 = \frac{z \; x \; 63}{(3.608 \, x \, 10^{-8})^3 \, 6.022 \, x 10^{23}}$	1
		z = 4 So it is face centred cubic lattice	½

CBSE SAMPLE PAPER CHEMISTRY-2017-18

MM: 70 **BLUE PRINT** **TIME 3 HRS**

No	CHAPTER	VSA	SA-1	SA-11	VBQ	LA	TOTAL
1	SOLID STATE					1(5) (U)	
2	SOLUTIONS		1(2) (U)	1(3) (A)			
3	ELECTROCHEMISTRY		1(2) (A)	1(3) (U)			9(23)
4	CHEMICAL KINETICS	1(1) (R)		1(3) (A)			
5	SURFACE CHEMISTRY	1(1) (R)		1(3) (R)			
6	EXTRACTION OF METALS			1(3) (U)			
7	p-BLOCK		1(2) (U)			1(5) (A)	
8	d AND f BLOCK ELEMENTS		1(2) (R)	1(3) (E&MD)			
9	COORDINATION CHEMISTRY	1(1) Hots		1(3) Hots			7(19)
10	HALOALKANES AND HALOARENES		1(2) (A)	1(3) (A)			
11	ALCOHOLS, PHENOLS AND ETHERS	1(1) (E&MD)		1(3) (U)			
12	ALDEHYDES, KETONES AND CARBOXYLIC ACID	1(1)Hots				1(5) (E&MD)	
13	ORGANIC COMPOUNDS COTAINING NITROGEN			1(3) (A)			
14	BIOMOLECULES			1(3) (U)			10(28)
15	POLYMERS			1(3) (E&MD)			
16	CHEMISTRY IN EVERY DAY LIFE				1(4) (E&MD)		
	Total						26(70)

R-Recall; U-Understanding; A-Application, Hots- Higher Order Thinking Skills-;
E&MD-Evaluation and multidisciplinary