## Marking scheme – 2017 (Compartment)

## CHEMISTRY (043)/ CLASS XII

## Set 56/1/2

	Value Points	Marks		
1	Orbital splitting energies are not sufficiently large for forcing pairing	1		
2	2,3-dinitro phenol			
3	Having α- hydrogen			
4	$(NH_4)_3 PO_4 / PO_4^{3-}$			
5	ccp / fcc			
6	Hypophosphorous acid is a good reducing agent as it contains two P-H bonds. There is no P-H bond in orthophosphoric acid, so it is not a reducing agent			
	Example: It reduces AgNO <sub>3</sub> to metallic silver/ chemical equation 1			
	OR			
6	a) 4	1		
	b) Due to lower bond dissociation enthalpy of BiH <sub>3</sub> as compared to SbH <sub>3</sub>	1		
7	i) (b) is chiral ii) (a)	19.		
8	(i) Zero order (ii) Mol L <sup>-1</sup> s <sup>-1</sup>	arm		
9	Vapour pressure of the solvent decreases in the presence of non – voilatile solute (glucose) hence boiling point increases	2		
10.	<ul> <li>i. Due to resonance the two S-O bond lengths are identical.</li> <li>ii. Absence of d- orbitals and most electronegative element.</li> </ul>	1 1		
11	a) Peptide linakge b) Water soluble – Vit. B/C , Fat soluble- Vit. A/D/E/K/B <sub>12</sub> c) .  6 CH <sub>2</sub> OH 5 H 5 O H	1 1/2 , 1/2		
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1		
12	<ul> <li>a) Temperature above which micelle formation takes place.</li> <li>b) Process of converting freshly prepared precipitate into sol by shaking it with dispersion medium along with a small amount of suitable electrolyte.</li> <li>c) The potential difference between fixed layer and the diffused layer</li> </ul>	1 1 1		
13	i) Treatment of hyperacidity Class: Antacids ii) Relieve pain and produce sleep Class: Narcotic analgesics iii) Relieve pain and reduce fever Class: Non- Narcotic analgesics / Analgesics	1/2 1/2 1/2 1/2 1/2 1/2 1/2		
14	<ul> <li>a) Glycosidic linkage</li> <li>b) Source : Meat, Fish, egg, curd (any one) ; Pernicious anaemia</li> <li>c) DNA is double strand while RNA is single strand molecule (or any other correct difference)</li> </ul>	1 ½,½ 1		
15	a) CH <sub>3</sub> -O-CH <sub>3</sub> + HI → CH <sub>3</sub> -OH + CH <sub>3</sub> -I	1		



<u> </u>		r			
	b) .				
	Protonation of alkene to form carbocation by electrophilic				
	attack of H <sub>3</sub> O <sup>+</sup> .				
	$H_2O + H^+ \rightarrow H_3O^+$				
	H	72.74			
	$>C = C < + H - \ddot{O}_{+} - H \Longrightarrow - \ddot{C}_{-} - \ddot{C}_{-} + H^{5}\ddot{O}_{-}$	1/2			
	Nucleophilic attack of water on carbocation.				
	TT TT				
	$-\overset{\mathbf{H}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}}}{\overset{\mathbf{C}}$	1/3			
	Deprotonation to form an alcohol.				
	$-\overset{H}{\overset{-}{\overset{-}{\overset{-}{\overset{-}{\overset{-}{\overset{-}{\overset{-}$	1			
16	In fcc, z=4 ;				
	$d = (zxM)/a^3x N_A $ (i)	1/2			
	No. of atoms = $\frac{w}{M} \times N_A$ $2.5 \times 10^{24} = \frac{250 g}{M} \times N_A$	1			
	$I_{M} = I_{M} = I_{M$	- m			
	$M = [250 \times N_A]/2.5 \times 10^{24}$ (ii) Putting values of M in equation (i)	OLIV			
	$d = 4 \times 250 \text{ g} \times N_A / [2.5 \times 10^{24} \text{ atoms} \times (400 \times 10^{-10} \text{ cm})^3 \times N_A]$	1/2			
	$d=6.25 g/cm^3$	1			
	(or any other correct method)				
17	a) The metal is converted into its volatile compound and collected	1			
	elsewhere. It is then decomposed to get the pure metal.	1/ . 1/			
	b) i) Ni ii) Ti/Zr c) It is used to separate two sulphide eres by proventing one to form froth	1/2 + 1/2			
18.	c) It is used to separate two sulphide ores by preventing one to form froth.	1			
10.	$p_{total} = p_1^{\circ} + (p_2^{\circ} - p_1^{\circ})^{X_2}$	1			
	600= 450 + (700-450) ×2	1   ½			
	$\frac{x_2}{2} = 0.6$	/ 2			
	$\frac{x_2}{2} = 1 - 0.6 = 0.4$	1/2			
19.		1 1			
15.	a) $H_2O < H_2S < H_2Se < H_2Te$ , because of decrease in bond dissociation enthalpy.	<b>1</b> ,1			
	Citality.				
	F F				
	Xe				
	F				
	b)	1			
	OR				
	a) i)Due to higher oxidation state of P in PCl <sub>5</sub>	1			
	ii) Liberation of hydrogen prevents the formation of FeCl <sub>3</sub>	1			
	Xe				
		1			
	b)				



20.	Hybridisation: sp <sup>3</sup> d <sup>2</sup>	1
41°	Magnetic character : Paramagnetic	1
	Spin nature: High spin	1
21	a) A: CH <sub>3</sub> - CH=CH <sub>2</sub> B: CH <sub>3</sub> - CH <sub>2</sub> -CH <sub>2</sub> Br C: CH <sub>3</sub> - CH <sub>2</sub> -CH <sub>2</sub> I D: CH <sub>3</sub> - CH <sub>2</sub> -CH <sub>2</sub> MgI	½ × 4
	$ \begin{array}{cccc} & & & & & & & & & & & & & & & & & & & $	1
22	D)	1/
22	$P_A = 2Po - Pt$ = $(2 \times 0.3) - 0.5 = 0.1$ $k = \frac{2.303}{t} log Po/P_A$	1/2
	$k = \frac{2.303}{100} \log 0.3/0.1$ $k = \frac{2.303}{100} \times 0.4771$	1
	$= 1.1 \times 10^{-2}  \text{s}^{-1}$	15.
23	a) Poly β-hydroxybutyrate – co-β-hydroxy valerate / (PHBV)  OH  OH	1/2 0 r m
	CH <sub>3</sub> -CH-CH <sub>2</sub> -COOH  Repeating unit:  CH-CH <sub>2</sub> -COOH  CH-CH <sub>2</sub> -COOH	1/2, 1/2
24	CH <sub>2</sub> CH <sub>3</sub> O  b) PHBV is used in speciality packaging, orthopaedic devices and in controlled release of drugs. (any two) c) Concern for environment, caring (or any other) a) A: Na <sub>2</sub> CrO <sub>4</sub> ; B: Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ; C: K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	½,½ ½,½ ½,½
<b>4</b> T	$4 \text{ FeCr}_2O_4 + 8 \text{ Na}_2CO_3 + 7 \text{ O}_2 \rightarrow 8 \text{ Na}_2CrO_4 + 2 \text{ Fe}_2O_3 + 8 \text{ CO}_2$ $2 \text{Na}_2\text{CrO}_4 + 2 \text{ H}^+ \rightarrow \text{Na}_2\text{Cr}_2O_7 + 2 \text{ Na}^+ + \text{H}_2\text{O}$	1
	$Na_2Cr_2O_7 + 2 KCl \rightarrow K_2Cr_2O_7 + 2 NaCl$ $Na_2Cr_2O_7 + 2 KCl \rightarrow K_2Cr_2O_7 + 2 NaCl$	1 1
	OR	
24	a) i)Copper; Due to high $\Delta_a H^{\Theta}$ and low $\Delta_{hyd} H^{\Theta}$ ii) Cerium ; Due to stable 4f <sup>0</sup> configuration / Tb ; Due to stable 4f <sup>7</sup> configuration b) i) Due to ability of oxygen to form multiple bonds to metal ii) HCl is oxidized to chlorine iii) Due to strong interatomic metallic bonding.	1/2 , 1/2 1/2 , 1/2 1 1 1
25	a) i).  + CH <sub>3</sub> - C - Cl Anhyd. AlCl <sub>3</sub> CH <sub>3</sub>	1
	ii) .	



CH3 CO CH3 + CH3 MgX — CH3 CO MgX — CH3 CO MgX — CH3 CO CH3							
b) i) Because it is a deactivating group / Due to electron withdrawing carboxylic group resulting in decreased electron density at o- and p- position.  ii) Due to extensive association of carboxylic acid molecules through intermolecular hydrogen bonding.  iii) Due to steric and +1 effect of two methyl groups in propanone  OR  25 a) i) .  In thy-CO-NH2  ii) CH3-CH(Br)-COOH  iii) CH3-CH(Br)-COOH  b) i) Add ammonical solution of silver nitrate / Tollen's reagent to both the compounds, propanal will give silver mirror while propanone does not.  ii) Add NaHCO3 solution to both the compounds, Benzoic acid will give effervescence and liberate CO2 while benzaldehyde will not. (Or any other suitable test)  26 a) E <sup>0</sup> value of silver is lower than that of gold, hence silver displaces gold which gets deposited on the silver object.  E <sup>0</sup> value of copper is lower than that of silver, hence silver cannot displace copper from its solution.  b) i) Electrons flow from Zn to Ag plate.  ii) Zn as anode and Ag acts as cathode  iii) Cell will stop functioning  iv) Concentration of Zn <sup>2+</sup> ions will increase and that of Ag <sup>+</sup> ions will decrease.  Va.		CH₃ CH₃					
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iv) Concentration of Zn <sup>2+</sup> ions will increase and that of Ag <sup>+</sup> ions will decrease. v) No change  OR  a) When concentration approaches zero, the molar conductivity is known as <b>limiting</b> molar conductivity  1		iii) Cell will stop functioning	1/2				
v) No change  OR  a) When concentration approaches zero, the molar conductivity is known as limiting molar conductivity  1			1/2. 1/2				
OR  26 a) When concentration approaches zero, the molar conductivity is known as limiting molar conductivity  1			1/2				
molar conductivity		OR					
molar conductivity	26	a) When concentration approaches zero, the molar conductivity is known as limiting					
	20	·	1				
		The change in $\Lambda$ m with dilution is due to the increase in the degree of dissociation and	1				
consequently the number of ions in the total volume of the solution that contains 1 mol of							
electrolyte, hence Λm increases steeply.							
b) $E_{cell} = E_{cell}^{o} - \frac{0.059}{n} \log \frac{[Mg2+]}{[Cu2+]}$		b) $E_{cell} = E_{cell}^{o} - \frac{0.059}{cell} \log \frac{[Mg^{2+}]}{[Cu^{2+}]}$	1				
			12,0000035				
$=2.71 \text{ V} - \frac{0.059}{2} \log \frac{0.1}{0.001}$			1				
$=2.71 \text{ V} - \frac{0.059}{2} \log 10^2$							
= 2.651 V 2			1				

1	Dr. (Mrs.) Sangeeta Bhatia	6	Sh. Rakesh Dhawan	
2	Dr. K.N. Uppadhya	7	Dr. (Mrs.) Sunita Ramrakhiani	
3	Prof. R.D. Shukla	8	Mrs. Preeti Kiran	



4	Sh. S.K. Munjal	9	Dr. Azhar Aslam Khan	
5	Sh. D.A. Mishra	10	Ms. Garima Bhutani	



