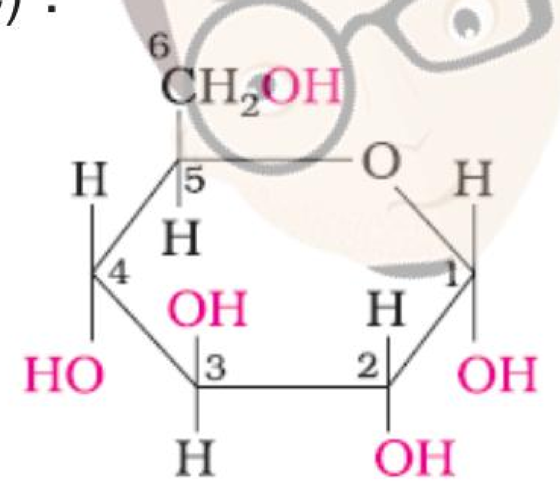
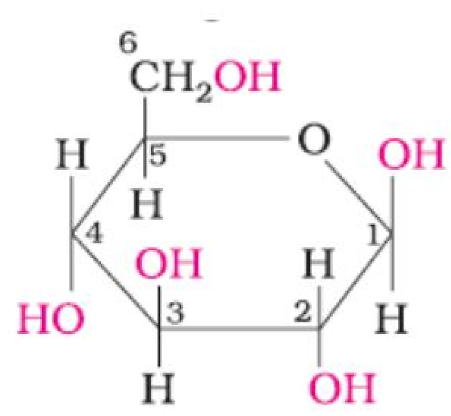
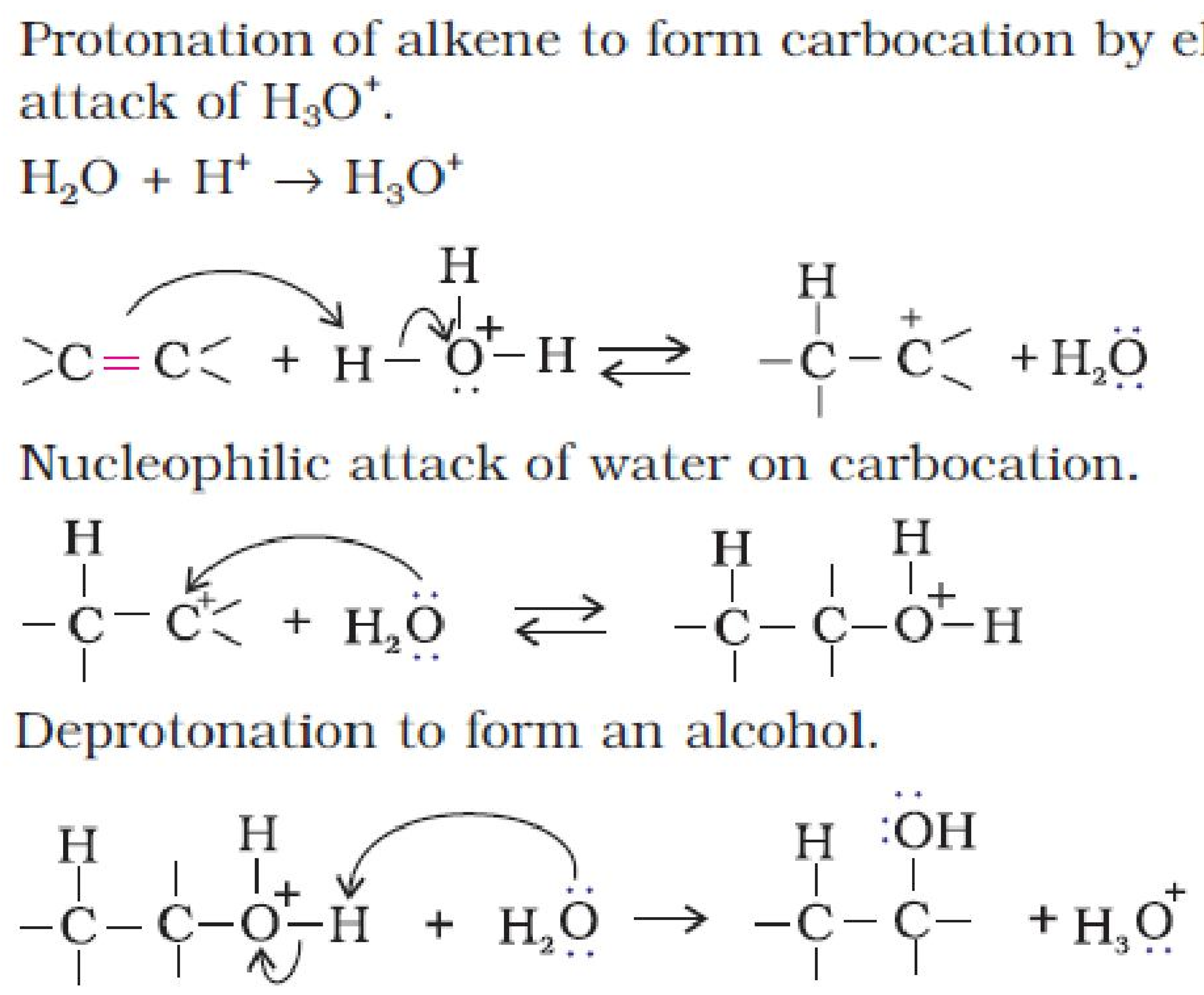
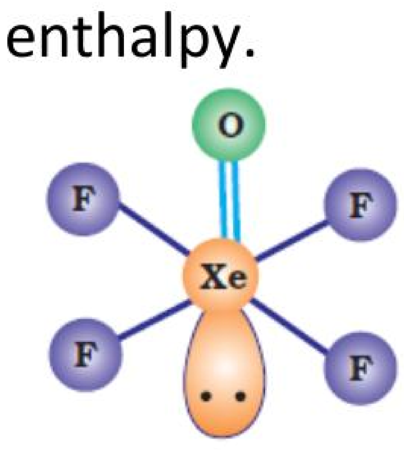
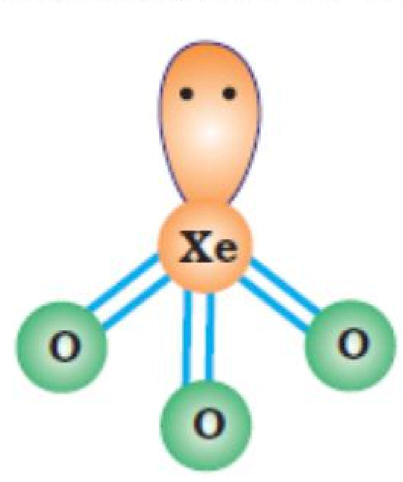
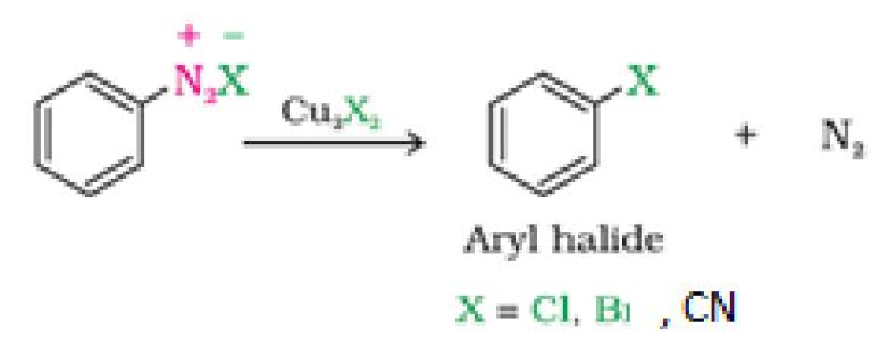
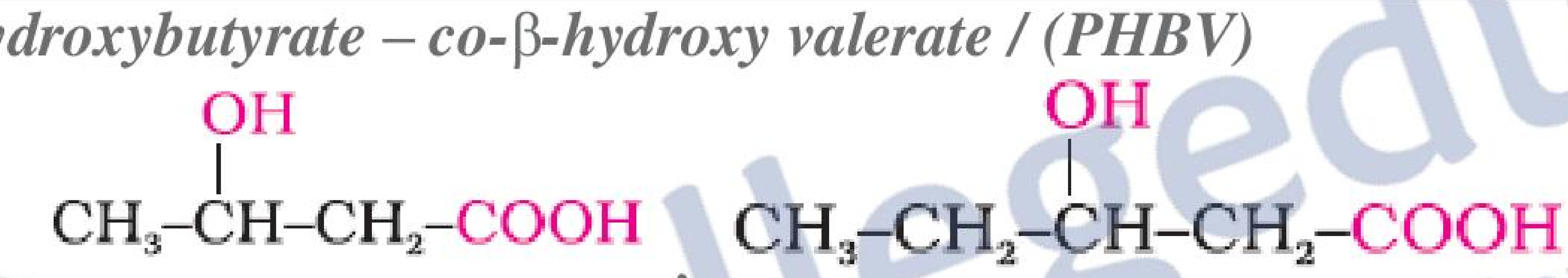
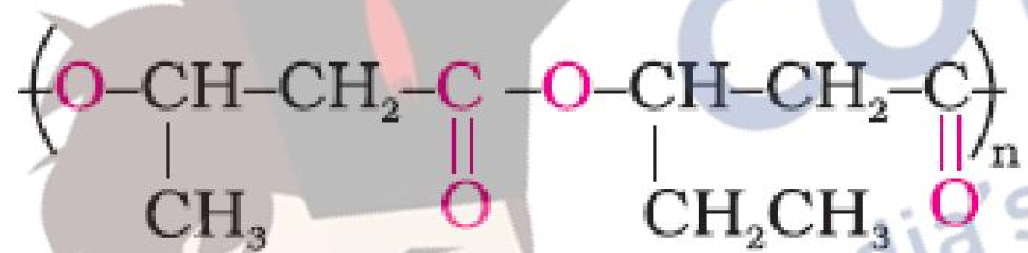
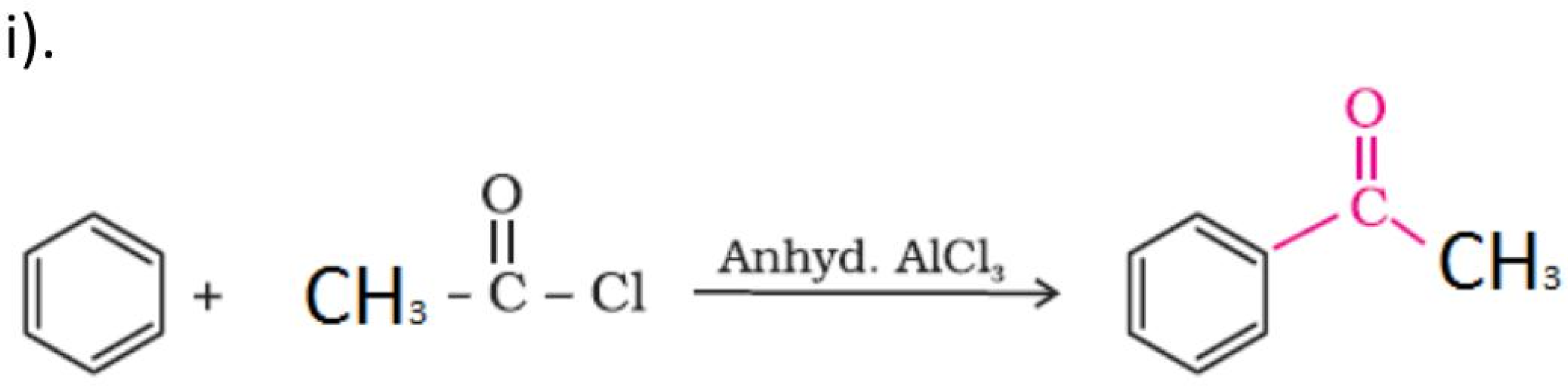
Marking scheme – 2017 (Compartment)

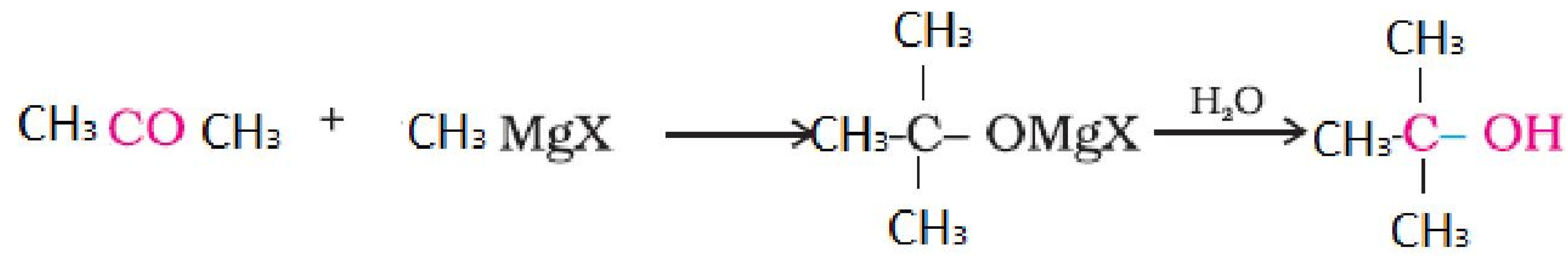
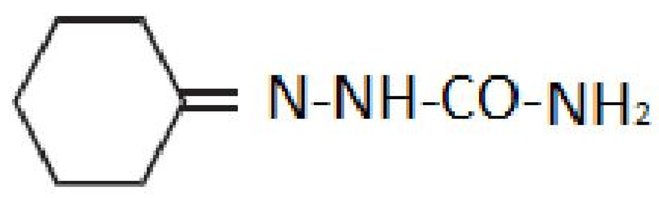
CHEMISTRY (043)/ CLASS XII

Set 56/1/2

Q.No	Value Points	Marks
1	Orbital splitting energies are not sufficiently large for forcing pairing	1
2	2,3-dinitro phenol	1
3	Having α- hydrogen	1
4	$(NH_4)_3 PO_4$ / PO_4^{3-}	1
5	ccp / fcc	1
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 $AgNO_3$ to metallic silver/ chemical equation	1 1
	OR	
6	a) 4 b) Due to lower bond dissociation enthalpy of BiH_3 as compared to SbH_3	1 1
7	i) (b) is chiral ii) (a)	1 1
8	(i) Zero order (ii) Mol $L^{-1}s^{-1}$	1 1
9	Vapour pressure of the solvent decreases in the presence of non – voilatile solute (glucose) hence boiling point increases	2
10.	i. Due to resonance the two S-O bond lengths are identical. ii. Absence of d- orbitals and most electronegative element.	1 1
11	a) Peptide linakge b) Water soluble – Vit. B/C , Fat soluble- Vit. A/D/E/K/B_{12} c) .  or 	1 ½ , ½ 1
12	a) Temperature above which micelle formation takes place. b) Process of converting freshly prepared precipitate into sol by shaking it with dispersion medium along with a small amount of suitable electrolyte. c) The potential difference between fixed layer and the diffused layer	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	½ ½ ½ ½ ½ ½
14	a) Glycosidic linkage b) Source : Meat, Fish, egg, curd (any one) ; Pernicious anaemia c) DNA is double strand while RNA is single strand molecule (or any other correct difference)	1 ½ , ½ 1
15	a) $CH_3\text{-}O\text{-}CH_3 + HI \longrightarrow CH_3\text{-}OH + CH_3\text{-}I$	1

	b) . 	½ ½ 1
16	In fcc, z=4 ; d = (zxM) /a^3x N_A (i) No. of atoms = $\frac{w}{M}$ × N_A $2.5 \times 10^{24} = \frac{250\,g}{M} \times N_A$ M= [250 × N_A] /2.5 × 10^{24} (ii) Putting values of M in equation (i) d= 4 x 250 g × N_A / [2.5 × 10^{24} atoms × $(400\text{x}10^{-10}\ \text{cm})^3$ x N_A] d= 6.25 g/ cm^3 (or any other correct method)	½ 1 ½ 1
17	a) The metal is converted into its volatile compound and collected elsewhere. It is then decomposed to get the pure metal. b) i)Ni ii) Ti/Zr c) It is used to separate two sulphide ores by preventing one to form froth.	1 ½ + ½ 1
18.	$p_{total} = p_1^o + (p_2^o - p_1^o)\ x_2$ $600 = 450 + (700-450)\ x_2$ $x_2 = 0.6$ $x_2 = 1- 0.6 = 0.4$	1 1 ½ ½
19.	a) $H_2O < H_2S < H_2Se < H_2Te$, because of decrease in bond dissociation enthalpy. b) 	1,1 1
	OR	
	a) i)Due to higher oxidation state of P in PCl_5 ii) Liberation of hydrogen prevents the formation of $FeCl_3$ b) 	1 1 1

20.	Hybridisation : sp^3d^2 Magnetic character : Paramagnetic Spin nature: High spin	1 1 1
21	a) A: CH_3- $CH=CH_2$ B: CH_3- CH_2-CH_2Br C: CH_3- CH_2-CH_2I D: CH_3- CH_2-CH_2MgI b) 	½ × 4 1
22	$P_A = 2Po - Pt$ $= (2 \times 0.3) - 0.5 = 0.1$ $k = \frac{2.303}{t} \log Po/P_A$ $k = \frac{2.303}{100} \log 0.3/0.1$ $k = \frac{2.303}{100} \times 0.4771$ $= 1.1 \times 10^{-2}\ s^{-1}$	½ ½ 1 1
23	a) *Poly β-hydroxybutyrate – co-β-hydroxy valerate / (PHBV)* *Monomers :*  *Repeating unit :*  *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)	½ ½ , ½ ½ ½ , ½ ½ , ½
24	a) A: Na_2CrO_4 ; B: $Na_2Cr_2O_7$; C : $K_2Cr_2O_7$ $4\ FeCr_2O_4 + 8\ Na_2CO_3 + 7\ O_2 \rightarrow 8\ Na_2CrO_4 + 2\ Fe_2O_3 + 8\ CO_2$ $2Na_2CrO_4 + 2\ H^+ \rightarrow Na_2Cr_2O_7 + 2\ Na^+ + H_2O$ $Na_2Cr_2O_7 + 2\ KCl \rightarrow K_2Cr_2O_7 + 2\ NaCl$	½ , ½ , 1 1 1 1
	OR	
24	a) i)Copper; Due to high $\Delta_a H^\ominus$ and low $\Delta_{hyd} H^\ominus$ ii) Cerium ; Due to stable $4f^0$ configuration / Tb ; Due to stable $4f^7$ 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.	½ , ½ ½ , ½ 1 1 1
25	a) i).  ii) .	1

	 	1
	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 + I effect of two methyl groups in propanone	1 1 1
	OR	
25	a) i) .  ii) CH_3COOH iii) CH_3 -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 $NaHCO_3$ solution to both the compounds, Benzoic acid will give effervescence and liberate CO_2 while benzaldehyde will not. (Or any other suitable test)	1 1 1 1 1
26	a) E^0 value of silver is lower than that of gold, hence silver displaces gold which gets deposited on the silver object. E^0 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^{2+} ions will increase and that of Ag^+ ions will decrease. v) No change	1 1 ½ ½ ½ ½, ½ ½
	OR	
26	a) When concentration approaches zero, the molar conductivity is known as **limiting molar conductivity** The change in Λm with dilution is due to the increase in the degree of dissociation and consequently the number of ions in the total volume of the solution that contains 1 mol of electrolyte , hence Λm increases steeply. b) $E_{cell} = E^o_{cell} - \frac{0.059}{n} \log \frac{[Mg2+]}{[Cu2+]}$ $= 2.71\ V - \frac{0.059}{2} \log \frac{0.1}{0.001}$ $= 2.71\ V - \frac{0.059}{2} \log 10^2$ = 2.651 V	1 1 1 1 1

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*These answers are meant to be used by evaluators

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