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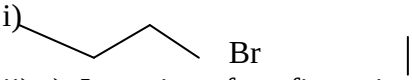
PRE-BOARD 2016-17
MARKING SCHEME

SUBJECT	CHEMISTRY		CLASS	XII

Q.1	a) By adding electrolyte b) By adding suitable solvent	1
Q.2	due to low bond dissociation enthalpy.	1
Q.3	2- Chloro -3,3-dimethylbutane	1
Q.4	Basicity = 1 due to presence of one OH	1
Q.5	Due to presence of lone pair of electrons	1
Q.6	(*i*) Ions cannot get into interstitial sites due to large size. (*ii*) This is due to availability of additional unpaired electrons on doping with phosphorous	2
Q.7	length of the side = 354 pm	2
Q.8	Correct shape	2
Q.9	State Raoult's law for a solution containing volatile components. How does Raoult's law become a special case of Henry's law? ANS (*a*) For a solution of volatile liquids, Raoult's law states that the partial vapour pressure of each component of the solution is directly proportional to its mole fraction present in solution, *i.e.*, $P_A \alpha X_A$, or $P_A = P_A^0 X_A$, According to Henry's law, the partial pressure of a gas in vapour phase (*p*) is directly proportional to mole fraction (*x*) of the gas in the solution. $P = K_H x$ On comparing it with Raoult's law it can be seen that partial pressure of the volatile component or gas is directly proportional to its mole fraction in solution. $P \alpha A$ only the proportionality constant K_H differs from *pA* o . Thus, it becomes a special case of Henry's law in which $K_H = pA$	2
Q.10	**(*a*) Kohlrausch's Law:** It states that the limiting molar conductivity of an electrolyte can berepresented as the sum of the individual contributions of the anion and cation of the electrolyte **Applications of Kohlrausch's Law:** Calculation of molar conductivities of weak electrolyte at infinite dilution: For example, molar conductivity of acetic acid (weak acid) at infinite dilution can be obtained from the knowledge of molar conductivities at infinite dilution of OR Cell constant $= 1.5 \times 10^{-4} \times 1500 = 0.225\ cm^{-1}$	2
Q.11	Molar mass = 256 g/mol	3
Q.12	*E*cell = 0.46– 0 0591/2 (log [0.1]/ $[10^{-3}]^2$) = **0.314 V**.	3
Q.13	(*i*) Correct definition (*ii*) Correct definition	3

	(*iii*) Correct definition	
Q.14	State the principles on which the following operations are based: (*i*) Zone refining (*ii*) Vapour phase refining. **OR** (*a*) What are the constituents of 'copper matte'? (*b*) What is the role of depressant in froth floatation process? i) Correct definition ii) Correct definition OR (*a*) Cu_2S and FeS. (*b*) In froth floatation process, the role of the depressant is to prevent certain type of particles from forming the froth with the air bubbles.	3
Q.15	i) Because S-S bond stronger than O-O . ii) Fluorine is a stronger oxidising agent than chlorine.due to low bond dissociation enthalpy of F_2 iii) Due to the ease with which librate atoms of nascent oxygen .	3
Q.16	i) Correct name and correct shape ii) Correct name and correct shape	3
Q.17	i)  ii) a) Inversion of configuration by S_N2, (b) Racemisation by S_N1	3
Q.18	i) + I effect in ketone more than aldehyde. ii) Carboxylate ion is more stabilised by resonance than phenoxide ion iii) Due to absence of alpha hydrogen	3
Q.19	(*i*) Clemanson reduction Correct reaction (*ii*) HVZ reaction Correct reaction (*iii*) Cannizzaro reaction Correct reaction	3
Q.20	(*i*) Aniline to chlorobenzene Correct conversion (*ii*) Ethanoic acid to methanamine Correct conversion (*iii*) Benzene diazonium chloride to phenol Correct conversion	3
Q.21	(*a*) Hydrogen bonds (intermolecular) between the C—O of one amino acid residue and N—H of the fourth amino acid residue in the chain give stability to the structure. (*b*) Correct answer	3
Q.22	Correct answer	3
Q.23	(*i*) Caring nature, helpful. (*ii*) Tranquilizers. (*iii*) Most of the drugs taken in doses higher than recommended may cause harmful effects and act as poison. Therefore, a doctor should always be consulted before taking the medicine	4
Q.24	(*i*) Reimer-Tiemann reaction Correct answer (*ii*) Williamson's ether synthesis Correct answer b)How will you convert: (*i*) Propene to Propan-1-ol? Correct answer (*ii*) Ethanal to Propan-2-o1? Correct answer OR (*ii*) Benzoic acid gives sodium bicarbonate test and Phenol does not	5

	(iii) Propan-1-ol gives lucas test upon heating and Propan-2-ol gives this test within 5 to 10 minute Correct mechanism of dehydration of alcohol	
Q.25	(*i*) In the formation of metallic bonds, no electrons from 3*d*-orbitals are involved in case of zinc,while in all other metals of the 3*d* series, electrons from the *d*-orbitals are always involved inthe formation of metallic bonds. That is why, the enthalpy of atomisation of zinc is the lowest in the series. (*ii*) This is due to filling of 4*f* orbitals which have poor shielding effect (lanthanoid contraction). (*iii*) Transition elements show variable oxidation states because electrons in *ns* and (*n* -1) *d*-orbitals are available for bond formation as they have nearly same energy. (*iv*) This is because the sum of enthalpies of sublimation and ionisation is not balanced by hydration enthalpy. (*v*) Cr2+ is a stronger reducing agent because after the loss of one electron Cr2+ becomes Cr3+ which has more stable t_{2g}^3 (half-filled) configuration in a medium like water. **OR** It is prepared by fusion of pyrolusite, MnO_2, with KOH in the presence of an oxidising agent like KNO_3. This produces the dark green potassium manganate, K_2MnO_4 which disproportionates in a neutral or acidic solution to give purple permanganate $2MnO_2 + 4KOH + O_2 \longrightarrow K_2MnO_4 + 2H_2O$ $3MnO_4^{2-} + 4H^+ \longrightarrow 2MnO_4^- + MnO_2 + 2H_2O$ Commercially, it is prepared by alkaline oxidative fusion of MnO_2 followed by the electrolytic oxidation of manganate (VI). MnO_2 Fused with KOH MnO_4^{-2} oxidised with air or KNO_3 Manganate ion $MnO_4^{2-} \longrightarrow MnO_4^-$ a) Correct equation b) Correct equation	5
Q.26	a) log *k1/k* 2 = Ea / 2.303 R [1/T1 – 1/T2] log 4 = *Ea* / 19 1471 [20 / 91709] *Ea* = 52863.2177 J mol^{-1} or 52.863 kJ mol^{-1} (*b*) Order of reaction = 2.5 OR a) first order kinetics. $t_{1/2}$ = 0.693 / k = 0.693 / 5.5 x 10^{-14} 1.26×10^{13} s. b)Correct answer	5