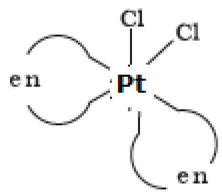
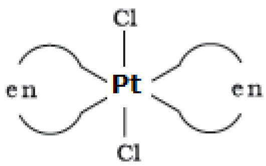
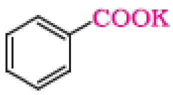
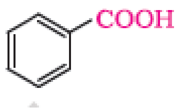
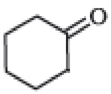
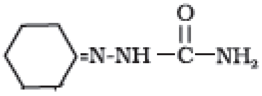
CBSE Class 12 Chemistry Question Paper Solution 2019

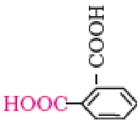
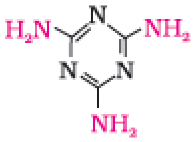
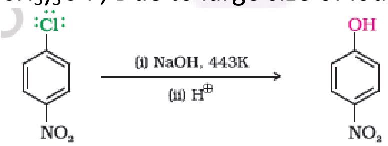
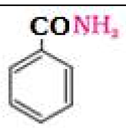
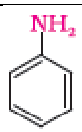
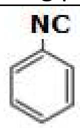
Marking scheme – 2019

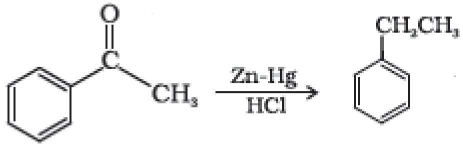
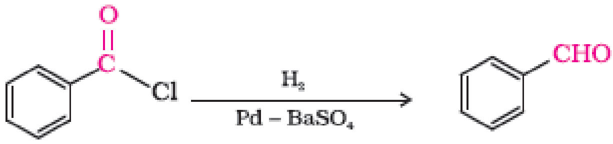
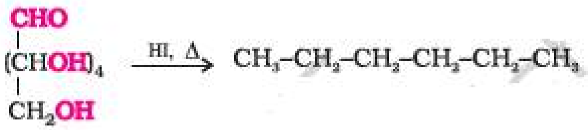
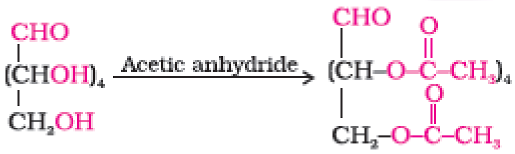
CHEMISTRY (043)/ CLASS XII

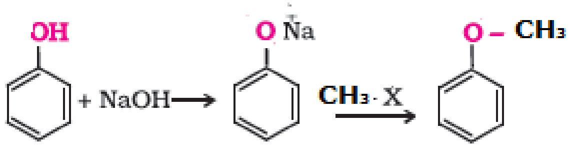
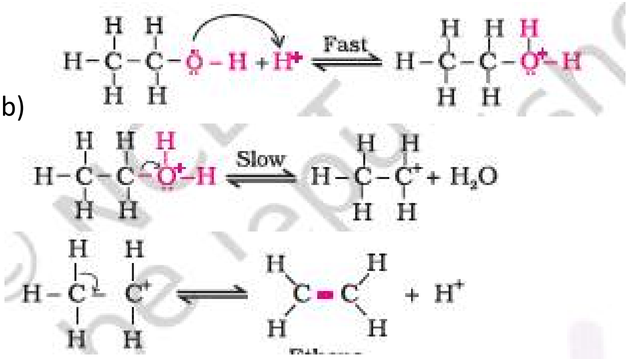
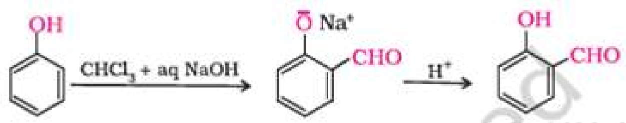
56/1/1

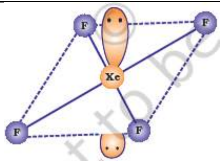
Q.No	Value Points	Marks
	SECTION A	
1	AgCl , Due to large difference in their size/ Due to small size of Ag^+ ion.	½ , ½
2	$(CH_3)_3N$ < $C_2H_5NH_2$ < C_2H_5OH	1
3	Due to large surface area these are easily assimilated or adsorbed.	1
	OR	
3	Emulsion – both dispersed phase and dispersion medium are liquid Gel- Dispersed phase is liquid while dispersion medium is solid	1
4	Nucleophiles having two nucleophilic centres. CN^- /SCN^- / NO_2^- (any one)	½ , ½
5	Glucose has aldehydic group while fructose has ketonic group/ Glucose is aldose while fructose is ketose.	1
	OR	
5	Glucose and Galactose	1
	SECTION B	
6	i) $2XeF_2\ (s) + 2H_2O(l) \rightarrow 2Xe\ (g) + 4\ HF(aq) + O_2(g)$ ii) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$	1 1
	OR	
6	i) H_2O < H_2S < H_2Se < H_2Te ii) HF> HCl > HBr > HI	1 1
7	For a solution of volatile liquids, the partial vapour pressure of each component of the solution is directly proportional to its mole fraction present in solution. (i) $\Delta_{mix}H = 0,$ (ii) $\Delta_{mix}V = 0$ (iii) The components have nearly same intermolecular force of attraction (any two)	1 ½, ½
8	i) Rate = k $[H_2O_2]$ $[I^-]$ ii) order = 2 iii) Step 1	1 ½ ½
9	A = K_2MnO_4 / MnO_4^{2-} , B= $KMnO_4$ / MnO_4^{-} , C= IO_3^- or KIO_3 , D= I_2	½ ×4
10.	Bis(ethan-1,2-diamine)dichloridoplatinum (II)   Cis Trans	1 ½ , ½
	OR	
10.	i) $[Co(NH_3)_6]_2(SO_4)_3$ ii)$K_3[Cr(ox)_3]$	1 1
11	i) $[CoF_6]^{3-}$ ii)$[Co(en)_3]^{3+}$ iii) $[Co(en)_3]^{3+}$ iv) $[CoF_6]^{3-}$	½ ×4

12	i) A=  B=  ii) A=  B= 	½ ×4
	SECTION C	
13	t= $\frac{[R]0-[R]t}{k}$ = $\frac{[0.1-0.064]}{4X\ 10^{-3}}$ = 9 s	1 1 1
14	i) Adsorption of toxic gases ii) Negative charge ; $Fe_2O_3.xH_2O/OH^-$ iii) Increases with increase in temperature/ First increases then decreases	1 ½ , ½ 1
15	d= $\frac{zm}{a^3\ N}$; m=Mass of element , N=number of atoms $N = \frac{108 X 4}{10.8X27X10^{-24}}$ = $1.48 X 10^{24}$ atoms Or M= $\frac{a^3\ \times N_a\ \times d}{Z}$ = $\frac{27\times10^{-24}\ \times 6.022\times10^{23}\ \times 10.8}{4}$ = 43.88 g mol^{-1} 43.88 g mol^{-1} contains 6.02×10^{23} atoms So , 108 g contains = $\frac{6.02\times10^{23}\ \times108}{43.88}$ = 1.48×10^{24} atoms	1 1 1 ½ 1 ½ 1
16	$\Delta T_f = K_f\ m$ $K_f = \Delta T_f\ X\ \frac{M_2 x\ w_1}{w_2\ x1000}$ = $\frac{2x\ 342\ x\ 96}{4x1000}$ = 16.4 K $\Delta T_f = K_f\ m'$ = $K_f \frac{w_2\ x1000}{M_2 x\ w_1}$ = $\frac{16.4\ x\ 5\ x\ 1000}{95x180}$ = 4.8 K $\Delta T_f = T_f^{o} - T_f$ $4.8 = 273.15 - T_f$ T_f = 268.35 K	½ 1 1 ½

17	a) i)Zone refining ii)Distillation b) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$ $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$	½ , ½ 1 1
18	i) Due to variable oxidation state ii)Mn^{2+} is stable due to exactly half filled $3d^5$ configuration/ Due to high ΔaH^0 and low $\Delta hydH^0$ for Cu^{2+} / Cu is positive. iii) Due to comparable energies of 5f , 6d and 7s orbitals.	1 1 1
19.	i) $HOOC(CH_2)_4COOH$, $H_2N(CH_2)_6NH_2$ ii) HO-CH_2-CH_2-OH ,  iii) $CH_2=CH-CH=CH_2$, 	1 ×3
	OR	
19	i) Homopolymers , single repeating unit ii)  , HCHO (Or names of monomers) iii) Sulphur forms cross links at the reactive sites of double bonds and thus the rubber gets stiffened / To improve the physical properties of rubber by forming cross links.	½ , ½ 1 1
20.	i) Tranquilizers ii) Anionic detergents iii) It is difficult to control the sweetness.	1 1 1
	OR	
20.	i) Antibiotics which kill or inhibit a wide range of Gram-positive and Gram-negative bacteria. Example- Chloramphenicol (or any other) ii) The chemicals which either kill or prevent the growth of microorganisms when applied to inanimate objects such as floors, drainage system, instruments, etc.Example – 1% Phenol solution (or any other) iii) Cationic detergents are quarternary ammonium salts of amines with acetates, chlorides or bromides as anions where Cationic part is involved in cleansing action. Example – Cetyltrimethylammonium bromide (Or any other)	½ , ½ ½ , ½ ½ , ½
21	i) $(CH_3)_3C$-I , Due to large size of iodine / better leaving group / Due to lower electronegativity. ii)  iii) Because enantiomers have same boiling points / same physical properties.	½ , ½ 1 1
22	**A =**  **, B =**  **, C=**  A= Benzamide , B= Aniline , C= Phenylisocyanide / Benzeneisonitrile	½ ×6
23	i) C_6H_5-CH(OH)-CN ii) 2 $CH_3COCH_2C_6H_5$ + $CdCl_2$ iii) $(CH_3)_2$-C(Br)COOH	1 1 1

	OR	
23	i)  ii)  iii) 	1 1 1
24	i) Amylose is water soluble component while amylopectin is water insoluble ii) Peptide linkage is –CONH- formed between two amino acids while glycosidic linkage is an oxide linkage between two monosaccharides. iii) In fibrous protein ,the polypeptide chains run parallel while in globular , the chains of polypeptides coil around to give a spherical shape (or any other correct difference.)	1 1 1
	OR	
24	i)  ii)  iii) 	1 1 1
	SECTION D	
25	$E_{cell} = E^{o}_{cell} - \frac{0.059}{n} \log K_c$ $= E^{o}_{cell} - \frac{0.059}{2} \log\frac{10^{-3}}{10^{-2}}$ $= 2.71 + 0.0295$ $E_{cell} = 2.7395$ V i)Cu to Mg / Cathode to anode / Same direction ii)Mg to Cu / Anode to cathode / Opposite direction	1 1 1 1 1
	OR	
25	(a) $m = z I t$ $2.8\text{ g} = \frac{56 \times 2 \times t}{2 \times 96500}$ t= 4825 s / 80.417 min $\frac{m1}{m2} = \frac{E1}{E2}$	½ ½ ½ ½

	$\frac{2.8}{mZn} = \frac{56}{2} X \frac{2}{65.3}$ $m_{Zn} = 3.265$ g b) i)A- strong electrolyte , B-Weak electrolyte ii)Λ^0m for weak electrolytes cannot be obtained by extrapolation while Λ^0m for strong electrolytes can be obtained as intercept.	1 1 1
26	 a) i) ii) $CH_3CH_2OH \xrightarrow{PCC,Heat} CH_3\text{-}CHO \xrightarrow{i)CH3MgBr\ ii)H+} CH_3CH(OH)\text{-}CH_3$ (or any other correct method)  b) c) Due to involvement of lone pair of oxygen in delocalisation makes the benzene ring electron rich.	1 1 ½ ½ 1 1
	OR	
26	a) i) *o*-Nitrophenol is steam volatile due to intramolecular hydrogen bonding while *p*-nitrophenol is less volatile due to intermolecular hydrogen bonding. ii) Due to the formation of stable intermediate tertiary carbocation / CH_3O^- being a strong base favours elimination reaction.  b) i) ii) (Award 1 mark if attempted in any way) c) Add neutral $FeCl_3$ to both the compounds, phenol will give violet colouration while ethanol does not.	1 1 1 1 1
27	a) i) In vapour state sulphur partly exists as S_2 molecule which has two unpaired electrons like O_2 . ii) Due to greater interelectronic repulsion iii) Because decomposition of ozone into oxygen results in the liberation of heat (ΔH is negative) and an increase in entropy (ΔS is positive), resulting in large negative Gibbs energy change (ΔG) for its conversion into oxygen. b) i) NO gas/ Nitric oxide ii) NO_2 gas / Nitrogen dioxide	1 1 1 1,1
	OR	
27	a) i) $4H_3PO_3 \rightarrow 3H_3PO_4 + PH_3$	1

	 ii) b) i) Due to small size and low bond dissociation enthalpy ii) As the size increases, electronegativity decreases / non-metallic character decreases c) $5SO_2 + 2MnO_4^- + 2H_2O \rightarrow 5SO_4^{2-} + 4H^+ + 2Mn^{2+}$	1 1 1 1