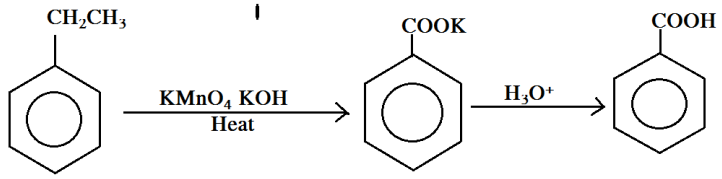
HIGHER SECONDARY SECOND TERMINAL EXAMINATION DEC , 2018

Answer Key with Detailed Solution

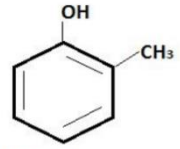
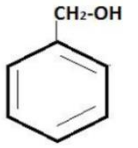
CHEMISTRY

Second Year ***Prepared By : Anoop Chandran S*** **CODE : SSE25**

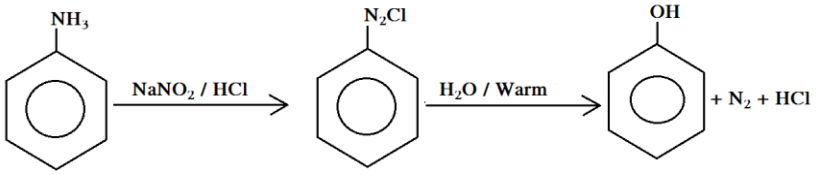
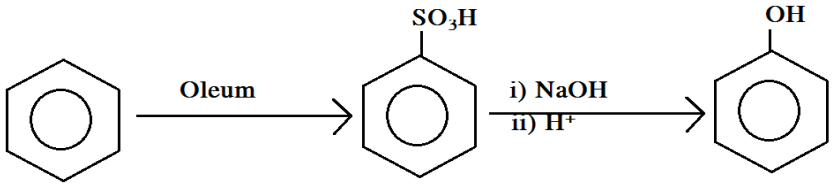
Qn No	Sub Qn.	Value Points / Scoring Indicators	Split Score	Total Score
1		DDT (Dichloro diphenyl trichloro Ethane) (NCERT page 309)		1
2		(d) or SCN^- (NCERT page 240)		1
3		PH_3 or (c) – phosphine		1
4		(d) Or Al - Aluminium		1
5		Since the unit of rate constant is S^{-1} the Reaction is a **First Order Reaction**		1
6		• In coordination compounds metals show two types of Valences – Primary and secondary valances. • Primary valences are ionisable and are satisfied with Negative ions • Secondary valences are non ionisable and are satisfied With neutral or negative ions. • The ions bounded by secondary linkages to metals have Characteristics spatial arrangements. (Any Two postulates)		2
7		Many of the Transition metals are used as catalyst because of Their ability to adopt variable oxidation state. Eg: Vanadium pentoxide in contact process. OR $2I^- + S_2O_8^{2-} \longrightarrow I_2 + 2\,SO_4^{2-}$ .. Iron(III) catalyses this Reaction.		2
8		Chloroform in presence of light undergo slow reaction with Air to produce poisonous gas carbonyl chloride or phosgene. $2\,CHCl_3 + O_2 \longrightarrow 2\,COCl_2 + 2\,HCl$		2
9		Due to the larger size of Te than S, H_2Te gives out Hydrogen Very easily in aqueous solution. Thus H_2Te is more acidic Than H_2S.	1	
		Due to the very high electronegativity of Oxygen compared To Sulphur , strong intermolecular H – bonding is possible in the Case of H_2O, which is not possible for H_2S. Thus H_2S		2

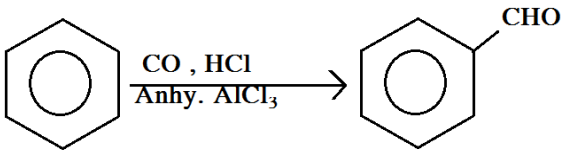
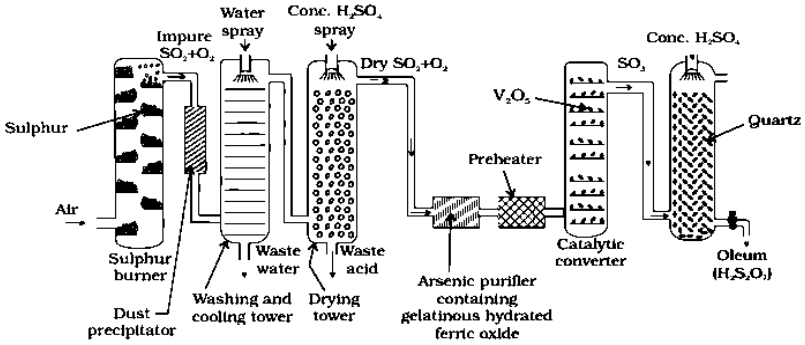
		is a gas and H_2O is a liquid.	1	
10		Formaldehyde on reaction with Grignard reagent (Methyl Magnesium halide) produces Primary alcohols (Ethanol) $HCHO + CH_3 - MgX \longrightarrow CH_3 - CH_2 - OmgX \xrightarrow{H_3O^+} CH_3\ CH_2\ OH + MgX(OH)$		2
11		(a) 	1	2
		(b) $2\ CH_3CHO \longrightarrow CH_3CH(OH)CH_2CHO \xrightarrow{} CH_3 - CH = CH- CHO$	1	
12		Saytzeff Rule - In dehydrohalogenation reactions, the preferred product Is that the one which carry greater number of alkyl groups on the doubly bonded carbon atoms.	1 1	2
13		When NaCl is heated in an atmosphere of sodium vapours, The sodium atoms get deposited at the cystal. Cl ions diffuse To the surface of the crystal and combines with Na to form NaCl. The electron thus released occupy the anion vacancy And are called F – Centers.		2
14		**Calcination** : involves heating when volatile matter escapes Leaving behind the metal oxide. **Roasting** : Ore is heated in a regular supply of air at a Temperature below its melting point.		2
15		Increased pressure under sea increases the solubility of gases In blood. When scuba divers come to the surface pressure Decreases and the gases as nitrogen comes out from blood And may block capillaries. This is called bendz. Partial pressure of oxygen is Less at altitude and can cause lesser amount of gas in blood as per Henry's Law. It is Anoxia	1 1	2

16		Sc – 21 – [Ar] $4s^2\,3d^1$ Sc^{3+} - [Ar] – All electrons are paired. Hence diamagnetic Ti – 22 – [Ar] $4s^2 3d^2$ Ti^{4+} - [Ar] – Since d orbitals are empty, d-d transition of Electrons are not possible.	**1** **1**	**2**
17		$[Co(CN)_6]$ and $[Cr(NH_3)_6]$		
18		Rate of the reaction = $-\frac{1}{5}\frac{\Delta[O]}{\Delta t} = \frac{1}{4}\frac{\Delta[NO]}{\Delta t}$ $= ¼ \times (3.6\times10^{-3}) = 9 \times 10^{-4}$. $\rightarrow 9\times10^{-4} = -\frac{1}{5}\frac{\Delta[O]}{\Delta t}$ $5 \times (9\times10^{-4}) = 4.5 \times10^{-3}$ → Rate of disappearance of Oxygen = 4.5×10^{-3} mol $l^{-1}S^{-1}$.		**2**
19		Electrical Disintegration or Bredig's arc Method. Colloidal sols of metals such as Gold , silver, platinum.		**2**
20	(a)	Stephen reaction. Nitriles are reduced to corresponding imines with stannous Chloride in presence of HCl which on hydrolysis gives Aldehyde. $RCN + SnCl_2 + HCl \longrightarrow RCH{=}NH \longrightarrow RCHO$	**1**	**3**
	(b)	Carboxyllic acids having alpha hydrogen on reaction with Halogen in presence of red phosphorous gives the alpha – Halo carboxylic acids. $RCH_2COOH + X_2 \xrightarrow[H_2O]{} RCH(X)\,COOH$	**1**	
	(c)	Etard Reaction - . Toluene on reaction with CrO_2Cl_2 in CS_2 Followed by hydrolysis gives benzaldehyde (Or Reaction)	**1**	

21	(a)	OH group directly attached to Benzene ring will only answer This test. So A may be ortho, meta or para cresol and B is Phenol.  O-Cresol may be , m/p also (I)  Bemzyl alcohol (II)	**1**	**3**
	(b)	Due to Resonance ..Also Draw the Resonance Structures.	**2**	
22	(a)	$MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl_2 + 2H_2O$ $H_2 + Cl_2 \longrightarrow 2HCl$	**1** **1**	**3**
	(b)	The smoke from supersonic jet planes contains Nitric Oxide NO which reacts with Ozone as follows. $NO + O_3 \longrightarrow NO_2 + O_2$	**1**	
23	(a)	• Chromate ore on fusion with free access of air gives Sodium carbonate $4FeCr_2O_7 + 8Na_2CO_3 + 7O_2 \longrightarrow 8Na_2CO_4 + 2Fe_2O_3 + 8CO_2$ • This solution on acidification with sulphuric acid give Orange coloured sodium dichromate. • Later this on treatment with KCl gives Potassium Dichromate. $Na_2Cr_2O_7 + 2KCl \longrightarrow K_2Cr_2O_7 + 2\ NaCl$	**1** **1**	**3**
	(b)	Di – or polydentate ligand uses its two or more donor atoms To bind to the single metal atom. It is known as chelating ligand.	**1**	
24	(a)	Painting/ Galvanisation/Cathodic protection/use of antirust Solutions such as Bisphenol. (Any two)	**2**	**3**
	(b)	The molar conductivity of a solution when its concentration Approaches Zero is called Limiting Molar conductivity.	**1**	
25	(a)	At 500 – 800 K Conversion of Metal ore to Metal oxide. At 900 – 1500K $C + CO_2 \longrightarrow 2CO$ $FeO + CO \longrightarrow Fe + CO_2$ Ionoxide get converted to Iron.	**2**	**3**

	(b)	The solidified copper obtained from convertor has a blistered appearance due to the evolution of SO_2. It is called Blister copper.	**1**	
26	(a)	<table><tr><th>S_N1 Reaction</th><th>S_N2 Reaction</th></tr><tr><td>Rate of the reaction depends On concentration of only One reactant. Reactivity order: $3^0 > 2^o > 1^o$</td><td>Rate of the reaction depends on concentration of both the Reactants. Reactivity order $1^o > 2^o > 3^o$</td></tr></table>	**2**	**3**
	(b)	It is because the byproduct formed are gases (SO_2 & HCl) And are easily escapable from the reacting system leving behi alkyl halide. $R - OH + SOCl_2 \longrightarrow R - Cl + SO_2(g) + HCl\ (g)$	**1**	
27	(a)	Ferromagnetic. When placed in a magnetic field all domains get alligned in The direction of magnetic field and it persist even after the Magnetic field is removed.	**1 ½**	**3**
	(b)	i) Insulator – Plastic ii) Conductor – Mg iii) Semiconductor – Si	**1 ½**	
28	(a)	Binary mixtures having same composition in liquid and Vapour phase and boils at a constant temperature.	**1**	
	(b)	Given that Vapour pressure of pure liquid A, P^o_A= 450 mm of Hg Vapour pressure of pure liquid A, P^o_A= 700 mm of Hg Total vapour pressure, ptotal= 600 mm of Hg Use the formula of Raoult's law $600 = (450 - 700) X_A + 700$ $250\ X_A = 100$ $XA = 100/250 = 0.4$ Use formula $X_B = 1 - X_A$ Plug the values we get	**2**	**3**

29		XB= 1 − 0.4 = 0.6 use formula $P_A = P^o_A \times X_A = 450 \times 0.4 = 180$ mm of Hg $P_B = P^o_B \times XB = 700 \times 0.6 = 420$ mm of Hg Now, in the vapour phase: $P_A = y_A \times P_{total}$ $Y_A = P_A / P_{total} = 180/600 =$ **0.3** $P_B = 1 - 0.3 =$ **0.7**		
		It considers the metal ligand bond to be ionic and there in Only electro static attraction between them./ Ligands are treated as point charges / **This Question May create a little confusion among the students. It is not specified whether they have to draw CF splitting in Octahedral or Tetrahedral CF.**	**2**	
	i)	Any diagram given in NCERT page no 251 / 252.		**4**
		Series of arrangement of ligands arranged in increasing order of their field strength is spectrochemical series.	**2**	
	ii)	Ligands for which $\Delta_0 < P$ is called weak ligands and form high spin complex due to the absence of pairing. Ligands for which $\Delta_0 > P$ is called strong field ligands and form low spin complexes.		
30	i)	By heating in aqueous Sodium hydroxide solution at a Temperature of 623K and 300atm pressure.	**1**	
	ii)		**1**	**4**
	iii)		**1**	

	iv)		**1**	
31			**2**	
	(a)	Contact process.	**1**	**4**
	(b)	$CaF_2 + H_2SO_4 \longrightarrow CaCl_2 + 2HF$	**1**	
35	(a)	Impurities react with flux added to form slag and are Removed. Eg: Silica in Iron is removed as $CasiO_3$ (Slag)	**1**	
	(b)	Leaching is the process of concentration of ores in which it is Soluble in a suitable solvent and impurities do not. Eg: Concentration of Bauxite (Ore of Alumina)	**1**	**4**
	(c)	The low melting metals are heated on a sloping surface and It is separated from high melting impurities. Eg: Tin	**1**	
	(d)	The graphical representation of Gibbs energy which give A sound basis for choosing of a reducing agent is called Ellingham Diagram.	**1**	

* Any Challenges in answer key Kindly inform me …

ANSWER KEY BY: ANOOP CHANDRAN S

anoopchandrac17@gmail.com

7902715940 (whatsapp)

SSE25