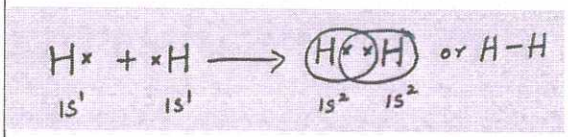
Scoring Indicators

Question Paper Set 2

APPLIED CHEMISTRY

Q No	Scoring Indicators	Split score	Sub Total	Total score
	PART A			**9**
I. 1	Pauli's exclusion principle		1	
I. 2	NaCl, KCl (any one example)		1	
I. 3	The point where the indicator changes colour in a titration.		1	
I. 4	pH value would decrease.		1	
I. 5	Water which does not produce lather readily with soap.		1	
I. 6	Phenol and formaldehyde		1	
I. 7	Any material which has got at least one dimension in the nanometer scale.		1	
I. 8	alkaline phosphate or alkaline chromate		1	
I. 9	The mass of the substance deposited by the passage of one coulomb of electricity		1	
	PART B			24
II. 1	Electronic configuration of Na Value of each quantum numbers n=3, l=0, m=0, s=1/2 or -1/2	1 4 x ½=2	3	
II. 2	Definition of co-ordinate bond Example- Formation of ammonium ion-equation	1 ½ 1 ½	3	
II. 3	Definition of ionic product. Mathematical statement	2 1	3	
II. 4	$Normality = \frac{wx1000}{Eq.wt.x\,V}$ $= \frac{2.8\,x1000}{56x\,250}$ =0.2N	1 1 ½ ½	3	

II. 5	Soda lime process- explanation	3	3	
II. 6	Definition of alloy Solder-Lead and Tin		3	
II. 7	Borosilicate glass is a type of glass that contains boron trioxide which allows for a very low coefficient of thermal expansion. Used for making glassware, high quality kitchen wares	2 1	3	
II. 8	Definition of addition polymer Examples	2 1	3	
II.9	Definition of strong electrolyte Example- NaCl (any one example) Definition of weak electrolyte Example- Acetic acid (any one example)	1 ½ 1 ½	3	
II.10	Presence of moisture, presence of electrolyte, presence of impurities (any three)	3 x1=3	3	
	PART C			42
III.1	Definition of ionic bond Explanation of formation of NaCl (Any one example) $Na \longrightarrow Na^+ + e$ (2,8,1) (2,8) $Cl + e \longrightarrow Cl^-$ (2,8,7) (2,8,8) $Na^+ + Cl^- \longrightarrow NaCl$ Definition of covalent bond Explanation of formation of H_2 or HF (Any one example) 	2 ½ ½ ½ 1 ½ 2	7	7

2	a) Heisenberg's uncertainty principle- statement $\Delta x \; x \; \Delta v \geq \frac{h}{4\pi m}$ $\Delta v = \frac{h}{4\pi m \Delta x}$ $\Delta v = \frac{6.625 \text{ x } 10^{-34} \text{ Kgm}^2 s^{-1}}{4 \; x 3.14 \; x \; 9.1 \; x \; 10^{-31} kg \; x 10^{-8} \text{m}}$ $= 5.8 \; x 10^{3} ms^{-1}$ b) Definition of orbital	2 1 1 ½ ½ 2	5 2	7
3	a) Definition of normality Equation Definition of molarity Equation $Molarity = \frac{wx1000}{Mol.wt.x\,V}$ $= \frac{4.9 \; x 1000}{98 \quad 600}$ $= 0.083\text{M}$ b) Definition of indicator.	1 ½ 1 ½ 1 ½ ½ 2	5 2	7
4	a) Definition of potable water Any four characteristics b) Any one method Explanation of method	1 4 X1=4 ½ 1 ½	5 2	7
5	a) (i) $[H^+] = 2 \; x \; 0.01 = 0.02$ $pH = -\log_{10}[H^+]$ $= -\log_{10}[0.02] = 1.69$ (ii) $pOH = -\log_{10}[OH^-]$ $= -\log_{10}[0.01] = 2$ $pH + pOH = 14$ $pH = 14 - pOH = 14 - 2 = 12$ b) Definition of acidic buffer One example	1 ½ 1 ½ ½ ½ 1 1 ½ ½	5 2	7

6	a) Cation exchange resins contains acidic functional groups and can exchange H^+ ions with cations like Ca^{2+} and Mg^{2+} ions Equation Anion exchange resins contains basic functional groups like -OH and can exchange OH^- with anions like Cl^-. Equation b) Any two disadvantages	1 ½ 1 1 ½ 1 2x1 = 2	5 2	7
7	a) Any five applications of nanomaterials b) Any two purposes of making alloys	5 x 1=5 2x1=2	5 2	7
8	a) Any four differences between thermoplastics and thermo setting plastics. One example for each b) Buna N- Butadiene and Acrylonitrile Buna S-Butadiene and Styrene	4 x1=4 2 x ½=1 1 1	5 2	7
9	Definition of electrolysis. <u>Electrolytic refining of copper</u> Anode- Impure metal Cathode-Pure metal Electrolyte-Acidified copper sulphate On passing the electric current through the electrolyte, the impure metal from anode dissolves into the electrolyte solution and pure metal from copper sulphate solution deposits on the cathode. At Anode (Oxidation) $Cu \rightarrow Cu^{2+} + 2e^-$ At Cathode (Reduction) $Cu^{2+} + 2e^- \rightarrow Cu$ The soluble impurities go into the solution and insoluble impurities settle down at the bottom of an anode and are known as anode mud.	1 ½ ½ ½ 2 1 1 ½	7	7

10	a) Definition of electrochemical cell At the Zinc electrode(anode) oxidation occurs. $Zn(s) \rightarrow Zn^{2+}(aq) + 2e$ At the Copper electrode (cathode) reduction occurs. $Cu^{2+}(aq) + 2e \rightarrow Cu(s)$ Net reaction, $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$ b) Definition of anodizing	2 1 1 1 2	5 2	7
11	a) Any four differences. One example for each b) Definition of primary cell One example	4 x1=4 2x ½ =1 1 ½ ½	5 2	7
12	a) Statement of Faraday's second law $\frac{m_1}{m_2} = \frac{E_1}{E_2}$ $m_1 = \frac{E_1}{E_2} x\, m_2$ $mass\ of\ copper\ deposited\ =$ $\frac{Equivalent\ mass\ of\ copper}{Equivalent\ mass\ of\ silver} x\ mass\ of\ silver$ $= \frac{31.7}{108} x\ 1.08 \quad = 0.317g$ b) Definition of corrosion	2 1 1 1 2	5 2	7