

Scoring Indicators

Question Paper Set 2

REV 21

APPLIED CHEMISTRY-1004

Q.No	Scoring Indicators	Split score	Sub Total	Total score
	PART A			9
I. 1	Definition	1	1	
I. 2	Covalent bonding	1	1	
I. 3	pH + pOH = 14	1	1	
I. 4	Phenolphthalein	1	1	
I. 5	Sterilization	1	1	
I. 6	Borosilicate glass or Pyrex Glass	1	1	
I. 7	Any one example	1	1	
I. 8	According to electronic concept, oxidation means loss of electron	1	1	
I. 9	Any one example	1	1	
	PART B			24
II. 1	$\Delta x \times \Delta p \geq h/4\pi$ $\Delta x \geq h/4\pi \times m \Delta v$ $= \frac{6.6 \times 10^{-34} \text{ kg m}^2 \text{ s}^{-1}}{4 \times 3.14 \times 9.1 \times 10^{-31} \text{ kg} \times 4.3 \times 10^2 \text{ ms}^{-1}}$ $= 1.342 \times 10^{-7} \text{ m}$	1 1 1	3	
II. 2	Definition $\text{Na} \rightarrow \text{Na}^+ + e^-$ 2,8,1 2,8 $\text{Cl} + e^- \rightarrow \text{Cl}^-$ 2,8,7 2,8,8 $\text{Na}^+ + \text{Cl}^- \rightarrow \text{NaCl}$ Proper explanation	1 1 1	3	

II. 3	Definition $K_w = [H^+] [OH^-]$	2 1	3	
II. 4	$[H^+] = 10^{-3}$ $pH = -\log_{10} [H^+]$ $= -\log 10^{-3}$ $= -(-3 \times \log 10)$ $= -(-3 \times 1)$ $= 3$	1 1 1	3	
II. 5	$M = \frac{W \times 1000}{m \times V}$ Molecular mass of KOH = 56 $= \frac{2.8 \times 1000}{56 \times 500} = 0.1 \text{ M}$	1 2	3	
II. 6	Definition Brass - Cu + Zn (ii) Solder - Pb + Sn	1 1+1	3	
II. 7	Homopolymers- Polymers whose repeating structural units are derived from only one type of monomers units. Copolymers- Polymers whose repeating structural units are derived from two or more types of monomer units. One example for each.	1 1 1	3	
II. 8	Definition Any two advantages of vulcanised rubber	1 2 x 1	3	
II.9	Any three relevant points	3 x 1	3	
II.10	Definition Any one example	2 1	3	

PART C				42
III.1	Postulates of Bohr atom model. Any two limitations.	5 x 1 2 x 1	7	7
III.2	(a) Correct statement (b) Electronic configuration of Aluminium Correct values of four quantum numbers	2 1 4x 1	2 5	7
III.3	(a) Correct statement of each (b) $N_1V_1 = N_2V_2$ $N_1 \times 20 = 0.11 \times 25$ $N_1 = \frac{0.1 \times 18}{20} = 0.09 \text{ N}$	2 x 2 1 1 1	4 3	7
III.4	(a) Definition Any one example for an acidic and basic buffer (b) Any four applications of pH	1 1+1 4 x 1	3 4	7
III.5	Reason for hardness of water. Removal of cation and anion with proper explanation	2 2 x 2.5	7	7
III.6	Correct statement Proper explanation of the processes screening, sedimentation, coagulation, filtration and sterilization	2 5 x 1	7	7
III.7	Correct statement Any one example. Any four characteristics of refractory materials.	2 1 4 x 1	7	7
III.8	Correct statement Any one example for two-dimensional nanomaterial. Any five applications of nanomaterials	1 1 5	7	7

III.9	Definition of electrolysis.	1	7	7
	Anode, cathode and electrolyte	3 x 1		
	Correct procedure for electroplating a mild steel spoon with nickel	3		
III.10	(a) Anode reaction	1	3	7
	Cathode reaction	1		
	Net reaction	1		
	(b) Anode – Zn	1	4	
	Cathode – Ag	1		
	EMF = $E_{\text{cathode}} - E_{\text{anode}}$	1		
	= 0.80 – (-0.76)			
	= 1.56 V	1		
III.11	(a) Statement of Faraday's second law of electrolysis.	1	3	7
	Mathematical expression	1		
	Explanation of terms	1		
	(b) $\frac{\text{Mass of silver deposited}}{\text{Mass of copper deposited}} = \frac{\text{Equivalent mass of silver}}{\text{Equivalent mass of copper}}$	1	4	
	$= \frac{1.078}{\text{Mass of copper deposited}} = \frac{107.8}{31.75}$	1		
	Hence, Mass of copper = $\frac{1.078 \times 31.75}{107.8} = 0.3175 \text{ g}$	2		
III.12	Definition of corrosion.	1	7	7
	Explanation of metallic (anodic and cathodic) and non-metallic (anodising and anti-rust solution) coatings	3+3		