TED (21) – 1004

(REVISION 2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/ COMMERCIAL PRACTICE

APPLIED CHEMISTRY

(Maximum Marks: 75) (Time: 3 hours)

Scheme of evaluation

Q No:	Scoring Indicators	Split Score	Sub Total	Total Score
	PART A			
I. 1	Matter wave or debroglie wave	1		9
I .2	Covalent bond	1		
I .3	$V_1 N_1 = V_2 N_2$	1		
I .4	$[H^+] = 10^{-4}$	1		
I .5	Demineralised water	1		
I .6	Lead and Tin	1		
I .7	Isoprene	1		
I .8	Quantity of electricity passed through the electrolyte	1		
I .9	Reduction	1		
	PART B			
II. 1	$\Delta x.\ m.\ \Delta v = \frac{h}{4\pi}$ or $\Delta x.\ \Delta v = \frac{h}{4\pi m}$ $\Delta x.\ \Delta v = \frac{6.626 \times 10^{-34}}{4 \times 3.14 \times 9.1 \times 10^{-31}}$ $= 5.477\ m^2 s^{-1}$	1 1 1		3
II. 2	Explanation Representation	2 1		3

II. 3	Normality equation $V_1 N_1 = V_2 N_2$ $25 \times 0.11 = 20 \times N_2$ N_2 (normality of base) = $\frac{25 \times 0.11}{20}$ $= \underline{0.1375N}$	1 1 1		3
II. 4	Any three disadvantages of hard water	1+1+1		3
II. 5	(a) Standard solution – definition (b) PPm – definition or equation	1.5 1.5		3
II. 6	Carbon nano tubes – explanation Two varities	2 1		3
II. 7	Classification of refractories Example for 3 classifications	1.5 1.5		3
II. 8	Anode reaction $Zn \rightarrow Zn^{2+} + 2e^-$ Cathode reaction $Cu^{2+} + 2e^- \rightarrow Cu$ Net cell reaction $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$	1 1 1		3
II. 9	Corrosion – explanation Any two examples	2 1		3
II.10	Electrolytes – definition - one example Non electrolytes – definition - one example	1 ½ 1 ½		3
	PART C			
III.	(a) Any three differences (b) $\lambda = \frac{h}{mv}$ debroglie equation m = 100g = 0.1kg $\lambda = \frac{6.626 \times 10^{-34}}{0.1 \times 10}$ $= \underline{6.626 \times 10^{-34}\ m}$	1+1+1 1 1 1 1	3 4	7
IV.	(a) Any 3 merits of Bohr model of atom (b) Electrovalent bond explanation Formation of NaCl example (representation)	1+1+1 2 2	3 4	7
V.	a) Ionic product of water – explanation Value at 25^0 C (10^{-14} moles^2 / l^2) b) Normality = $\frac{\text{Wt. / litre}}{\text{Eq. mass}}$	2 1 ½	3	

	$= \frac{1.075 \times 4}{53}$ $= \underline{0.0811\ N}$ Molarity $= \frac{\text{Wt. / litre}}{\text{Mol. mass}}$ $= \frac{1.075 \times 4}{106}$ $= \underline{0.04M}$	1 ½ ½ 1 ½	4	7
VI.	(a) Any 3 characteristics of portable water (b) Sterilization – explanation Chemical changes involved in the sterilization using bleaching powder	1+1+1 2 2	3 4	7
VII.	(a) Buffer solution- explanation Acidic buffer (any one) example Basic buffer (any one) example (b) (i) $[H^+]$ of 0.002 M $H_2SO_4 = 2 \times 0.002$ moles/*l* $P^H = -\log_{10}[H^+]$ $= -\log_{10} 0.004$ $= \underline{2.39}$ (ii) $[OH^-]$ of 0.001 M NaOH = 0.001 moles/*l* $[H^+] = \frac{10^{-14}}{0.001} = 10^{-11}$ moles/*l* $P^H = -\log_{10}(10^{-11})$ $= \underline{11}$	2 ½ ½ 2 2	3 4	7
VIII	(a) Any 3 differences between temporary and permanent hardness (b) Block diagram (figure) explanation	1+1+1 2 2	3 4	7
IX.	(a) Any 3 purposes of making alloys (b) Any 3 differences between thermoplastics and thermosetting plastics. One example each	1+1+1 1+1+1 ½ + ½	3 4	7
X.	(a) Homopolymer – explanation (one example) Copolymer – explanation (one example) (b) Any 4 applications of nano materials	1.5 1.5 1+1+1+1	3 4	7
XI.	(a) Any 3 differences between electrolytic cell and galvanic cell	1+1+1	3	

	(b) Faradays 1st law m=ZIt m = 0.00033 x 1.5 x 10 x 60 = 0.297 g	1 2 1	4	7
XII.	(a) Fuel cell – explanation one example (b) Explanation of electro refining of copper necessary reactions	2 1 2 2	3 4	7
XIII	(a) Primary cell - explanation (one example) Secondary cell - explanation (one example) (b) Any 4 differences between metallic and electrolytic conduction.	1.5 1.5 1+1+1+1	3 4	7
XIV	(a) Electrochemical series - explanation any one application (b) Explanation of any 2 methods of barrier protection.	2 1 2+2	3 4	7

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