I

Sheet1

Revision TED(15)1004	Course code 1004
Course title Engineering Chemistry - I	

		Split up	Sub total	Total
I	**Part A.**			
1.	Materials of the size 1-100 nm range eg: carbon nanotube, DNA (any two)	1 1	-	2
2.	An acid-base pair that differ by a proton. ~~NH_3 NH_4^+ (any one pair)~~	2 1		2
3.	any two advantages	1+1		2
4.	cast iron - iron containing 2-5% C wrought iron - iron containing less than 0.2% C	1 1		2
5	a weak organic acid or base which can change its colour with variation in pH of solution to which it is added	2		2
II	**Part B.**			
(a)	$CaOCl_2 + H_2O \rightarrow Ca(OH)_2 + Cl_2$ (Bleaching Powder) $Cl_2 + H_2O \rightarrow HOCl + HCl$ $HOCl \rightarrow HCl + [O]$ or Nascent oxygen is produced with reaction with water, which kills insect organisms	1 1 1 1		3

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(b)	any three characteristics		1+1+1		3
2. (a)	(i) $^{14}_{7}N$ – p – 7 n – 7 e⁻ – 7		1½		3
	(ii) $^{35}_{17}Cl$ p – 17 n – 18 e – 17		1½		
(b)	any three properties		1+1+1		3
3. (a)	weight of acid which contains ~~1 parts~~ 1.008 parts by weight of replaceable hydrogen		2		3
	Equivalent weight of acid = Molecular wt / Basicity		1		
(b)	Molarity = No. of moles of solute / Vol. of solution in L		1		3
	molecular ~~wt~~ weight HNO_3 = 63				
	$M = \frac{1.57 \times 1000}{63 \times 100}$		½		
	= 0.2492 M		½		

Sheet 3

Revision Course title .	Course code			
		Split up	Sub total	Total
4 (a)	Soap is sodium salt of higher fatty acid Hardwater contains Mg^{2+} & Ca^{2+} ions Soaps reacts with these ions forms insoluble salt of soaps.	1 1 1		3
(b)	Block diagram with all detail			3
5 (a)	Toxicity Pyrophoricity or any three Explosivity	1+1+1		3
(b)	Cast iron, wrought iron, steel →	1½		
	Cast iron - can't be permanently magnetized Wrought iron - Easily magnetised, but not permanent. Steel - can be permanently magnetised	1½		3
6.	Acidic buffer - weak acid + its salt with strong base $CH_3COOH + CH_3COONa$ (any one eg)	1½		
	Basic buffer - Weak base + its salt with strong acid $NH_4OH + NH_4Cl$ (any one eg	1½		3

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7 (a)	any three differences	(1+1+1)		3
(b)	Al - 95%. Cu - 4%. Mn - 0.5%. Mg - 0.5%.	2		3
	for making aeroplane, pressure cookers automobile parts (any two)	1		
	Part-C			
	Unit - I			
III		3+3		
(a)	Explanation of ~~any~~ Two three methods			6
(b)	Proton, neutron, electron	2		
	p - $+1.602 \times 10^{-19}$ C e - -1.602×10^{-19} C n - 0 } charge	1½		
	p - +ve e - -ve n - 0	1		5
	$\bar{e}$ - 9.109×10^{-31} kg. p - 1.007×10 n - 1.674×10^{-27} kg } mass	1½		

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c	any four applications	1+1 1+1		4
IV				
(a)	Homogeneous – reactants and catalyst are in same phase	1		
	1. $2SO_{2(g)} + O_{2(g)} \xrightarrow{NO_{(g)}} 2SO_{3(g)}$		3	8
	2. Hydrolysis of methylacetate in presence of H^+	1		
	or $CH_3COOCH_3 + H_2O_{(l)} \xrightarrow{H^+_{(aq)}} CH_3COOH + CH_3OH$			6
	Heterogeneous – reactants and catalyst are in different phases.	1		
	$2SO_{2(g)} + O_{2(g)} \xrightarrow{Pt_{(s)}} 2SO_{3(g)}$	1	3	
	Haber process	1		
	(any two examples)			
(B)	Promoter – enhance activity of catalyst	1		
	eg: $N_{2(g)} + 3H_{2(g)} \xrightarrow{Fe(Mo)} 2NH_{3(g)}$	1	2½	
	Mo act as promoter	½		5
	poison – which decrease the activity of catalyst.	1		
	eg: $2SO_{2(g)} + O_{2(g)} \xrightarrow{\text{Platinised asbestos}/As_2O_3} 2SO_3$	1	2½	
	As_2O_3 act as a poison	½		