B.N. Bandodkar college of Science, Thane
F.Y.B.Sc. IInd Semester examination 2013-2014
USCH201

Duration 2 hrs

Marks 60

N. B. :
1. All the questions are compulsory
2. Figures to the right indicates full marks
3. Use of log table/ non programmable calculator is allowed

Q.1 a Derive integrated rate equation for first order reaction. 4

OR

a Derive integrated rate equation for second order reaction. 4

b Discuss time for equifraction method to determine order of reaction. 4

OR

b Derive Arrhenius equation. 4

c In a second order reaction with both reactant taken in equal concentrations, the time required for the completion of 25% reaction was 36000 s. How much time required for the completion of half of the reaction. 4

OR

c Show that in first order reaction the time required for 75% reaction is double that required for half reaction. 4

d How quantum yield determined experimentally? 3

OR

d Write a short note on Photochemical smog. 3

Q. 2 a With reference to the group 13 elements discuss the following properties: 4
i) Atomic radius ii) Melting point / Boiling point.

OR

a Write Iupac names of the following complexes: 4
i) $[Co (NH_3)_6]Cl_3$ ii) $K_4[Fe (CN)_6]$
iii) $[Ni (dmg)_2]$ iv) $Na [Au (CN)_2]$

b Explain the following isomerism with suitable example: 4
i) Ionization isomerism ii) Hydrate isomerism.

OR

b Explain the classification of ligands with suitable example. 4

c Draw cis and trans geometrical isomers of the following complexes: 4
i) $[Pt (NH_3)_2Cl_2]$ ii) $[Pt Br Cl (NH_3)_2]$
iii) $[Co Cl_2 (NH_3)_4]^+$ iv) $[Co Cl_2 (en)_2]^+$

OR

c Write any four analytical applications of co-ordination compounds. 4

d Write any three characteristics of complex ion. 3

OR

d Write the postulates of Werner's theory. 3

Q. 3	a	Distinguish between Configuration and Conformation.	4
		OR	
	a	Distinguish between Enantiomers and Diastereoisomers.	4
	b	Explain Conformation of ethane and their relative stabilities with potential energy diagram.	4
		OR	
	b	What is mean by projection formula?Explain Newmann formula.	4
	c	What is isomerism?Explain different types of isomerism,giving examples.	4
		OR	
	c	Draw Fischer formula of Erythro-3-bromo-2-butanol and Convert it into Saw-horse formula.	4
	d	Explain Chirality with examples.	3
		OR	
	d	Explain E_1-Mechanism of Dehydrohalogenation reaction with energy profile diagram.	3
Q. 4	A		
	a	State Grothus Drappper law.	3
		OR	
	a	State Stark Einstein law.	3
	b	Calculate the energy of photon and an Einstein corresponding to Wavelength 500 nm	2
		OR	
	b	If the value of an Einstein is 230 KJ find the Wavelength of the light involved.	2
	B		
	a	Write any three uses of aluminium chloride.	3
		OR	
	a	How will you classify the co-ordination compounds depending on the charge present on the complex ion ?	3
	b	Define the terms: i) Co-ordination compounds. ii) Co-ordination number.	2
		OR	
	b	Write down the electronic configuration of following elements: i) Thallium (At.no. 81) ii) Gallium (At.no. 31)	2
	C		
	a	Explain concept of elements of Unsaturation with 3 examples.	3
		OR	
	a	Write short note on olefin polymerization.	3
	b	Explain E_2-Mechanism of Dehydrohalogenation reaction with energy profile diagram.	2
		OR	
	b	Explain Saytsev Rule with example.	2

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