LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

SECOND SEMESTER – **APRIL 2022**

UCH 2303 – CHEMISTRY FOR PHYSICS

(21 BATCH ONLY)

Date: 27-06-2022 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A

Answer ALL the Questions

1.	**Define the following**		**(5 x 1 = 5 Marks)**	
	a)	Normality.	K1	CO1
	b)	Chelate effect.	K1	CO1
	c)	Solubility product	K1	CO1
	d)	Quantum yield	K1	CO1
	e)	Hardness of water.	K1	CO1
2.	**Fill in the blanks**		**(5 x 1 = 5 Marks)**	
	a)	The normality of one molar sodium hydroxide is _____.	K1	CO1
	b)	EDTA is a _____ dentate ligand.	K1	CO1
	c)	Ionic product of water (K_w) is_____	K1	CO1
	d)	The concept of molecularity is _____ in nature.	K1	CO1
	e)	Thermoplastic can be synthesized by _____ polymerization.	K1	CO1
3.	**Match the following**		**(5 x 1 = 5 Marks)**	
	a)	Toxic compound - Ammonia	K2	CO1
	b)	Ferrous Ammonium Sulphate – speeds up a reaction	K2	CO1
	c)	Lewis base -Ca^{2+} and Mg^{2+}	K2	CO1
	d)	Catalyst -Double salt	K2	CO1
	e)	Eriochrome Black-T -Fume-hood	K2	CO1
4.	**TRUE or FALSE**		**(5 x 1 = 5 Marks)**	
	a)	Glass rods and tubes should not be fire-polished.	K2	CO1
	b)	The IUPAC name of $K_4[Fe(CN)_6]$ is tetrapotassium hexacyanoferrate.	K2	CO1
	c)	Buffer Solution cannot resist a change in pH upon dilution or upon the addition of small amounts of acid or alkali to them.	K2	CO1
	d)	Order of a reaction is always whole number	K2	CO1
	e)	Polyester is not a bio degradable polymer.	K2	CO1

SECTION B

Answer any TWO of the following in 100 words **(2 x 10 = 20 Marks)**

5.	a) Compare and contrast double salt and coordination compound. b) Write the prerequisites for a compound to be used as a primary standard. (5+5)	K3	CO2
6.	a) Mention the BIS specifications of drinking water. (5) b) Purification of water by ozone is superior than using chlorine. Rationalize. (5)	K3	CO2
7.	a) Relate the concept of acids and bases using Lewis and Arrhenius theory with suitable examples. (5)	K3	CO2

	b) Calculate the activation energy of a reaction whose rate constant is doubled by a 10ºC rise in the vicinity of 27ºC. (5)		
8.	a) Show the synthetic method of Bakelite and illustrate its applications. (5) b) Explain phosphorescence and fluorescence with a suitable examples. (5)	K3	CO2
	SECTION C		
	Answer any TWO of the following in 100 words (2 x 10 = 20 Marks)		
9.	a) Discuss the methods of minimization of errors in an analysis. (5) b) The concentration of Cl^- ion in a sample of water is 15 ppm. What mass of Cl^- ion present in 240 mL of water which has density of 1 g/mL. (5)	K4	CO3
10.	a) Outline the applications of coordination compounds. (5) b) Find the molar concentration of H_2SO_4 when 50 mL H_2SO_4 solution is titrated with 28 mL of 0.05 N NaOH solution. (5)	K4	CO3
11.	a) Differentiate the following: (i) Strong and weak electrolytes. (5) (ii) Order and molecularity b) Explain the process of photosensitization with suitable examples. (5)	K4	CO3
12.	Classify the polymers based on the following and Cite an example for each classification: (i) Source (ii) Structure of monomer (iii) Polymerization process (iv) Molecular forces	K4	CO3
	SECTION D		
	Answer any ONE of the following in 150 words (1 x 20 = 20 Marks)		
13.	a) Explain the different types of hardness of water and how they are estimated quantitatively. (10) b) Discuss the Werner's theory of coordination compounds and its limitations. (10)	K5	CO4
14.	a) Compare the applications of thermosetting, thermoplastic and biodegradable polymers with suitable examples. (8) b) Deduce the rate expression for second order reaction with equal concentration of reactants. (7) c) Solution of ammonium acetate is a buffer while that of sodium chloride is not. Justify. (5)	K5	CO4
	SECTION E		
	Answer any ONE of the following in 150 words (1 x 20 = 20 Marks)		
15.	a) Construct an ion exchanger to demineralise water and explain the reactions involved in it. (5) b) Outline the safety rules to be followed in storing chemicals and while doing experiments in the chemistry laboratory. (10)	K6	CO5

	c) Justify how the temperature and catalysts affecting the rate of a reaction. (5)		
16.	a) Write the cell representation, cell diagram and working principle of Laclanche cells and sodium-sulphur batteries. (10) b) Generalize any two methods of determining order of a chemical reaction. (10)	K6	CO5

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