LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

THIRD SEMESTER – **APRIL 2025**

UCH 3401 – APPLIED CHEMISTRY FOR PHYSICS

Date: 03-05-2025 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)	
	Answer ALL the Questions -	**(10 x 1 = 10)**
1.	**MCQ**	
a)	Liquid crystal molecules have _____ structure. a) cylinder b) spherical c) rod d) circular	
b)	The TG curve of $CaC_2O_4.H_2O$ shows _____ step decomposition. a) one b) two c) three d) four	
c)	In the phase diagram of water, the point where all three phases coexist is called _____. a) eutectic point b) triple point c) isoelectric point d) critical point	
d)	Corrosion occurs due to the exposure of iron to _____. a) oxygen b) hydrogen c) sulphur d) nitrogen	
e)	Which of the following is not a lipid? a) Fat b) Oil c) Protein d) Wax	
2.	**Match the following**	
a)	Diamagnetic property - Lead-silver system	
b)	DTA - Potatoes	
c)	Two component - Meissner effect	
d)	Rust iron - Metallurgy	
e)	Starch - Fe_2O_3	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**True or False**	
a)	Type-II superconductors do not exhibit a Meissner effect.	
b)	A DTA curve is plotted ΔT vs temperature.	
c)	Phase diagram of sulphur is one component and four phase system.	
d)	Corrosion can be prevented by painting.	
e)	Sucrose is a polysaccharide form of carbohydrates.	
4.	**Define the following**	
a)	Non-linear optics	
b)	Thermogram	
c)	Gibb's Phase rule	
d)	Erosion	
e)	Zwitter ion	
	SECTION B - K3 (CO2)	
Answer any TWO of the following		**(2 x 10 = 20)**
5.	Explain the classification of liquid crystals with suitable examples.	
6.	Sketch and explain the DTG curve of $CuSO_4.5H_2O$.	
7.	Draw and explain the phase diagram of sulphur system.	
8.	Discuss the galvanic and electrochemical corrosions with an example for each.	

SECTION C – K4 (CO3)		
Answer any TWO of the following		**(2 x 10 = 20)**
9.	a) List any five applications of superconducting materials.	(5)
	b) Explain the BCS theory of superconductivity.	(5)
10.	a) Sketch the thermogram of silver nitrate and explain.	(5)
	b) Discuss the factors affecting thermogram.	(5)
11.	Sketch and explain the phase diagram of lead-silver system.	
12.	Describe the following terms. i) Isoelectric point ii) Essential amino acids iii) Reducing and non-reducing sugars	(3+3+4)
SECTION D – K5 (CO4)		
Answer any ONE of the following		**(1 x 20 = 20)**
13.	a) Analyze and interpret the DTA curves of calcium oxalate monohydrate.	(10)
	b) Sketch and explain the phase diagram of water system.	(10)
14.	a) Describe the following: (i) Organic coatings (ii) Corrosion inhibitors	(10)
	b) Explain the following terms: i) Iodine number ii) Acid number iii) RM value iv) Saponification value	(4 x 2.5)
SECTION E – K6 (CO5)		
Answer any ONE of the following		**(1 x 20 = 20)**
15.	a) Distinguish between Type-I and Type-II superconductors.	(10)
	b) Explain briefly the instrumentation of DTA.	(5)
	c) Derive the Gibb's phase rule for a heterogeneous system.	(5)
16.	a) Discuss the anodic and cathodic protections in corrosion.	(10)
	b) Explain any three tests to identify the presence of carbohydrates with relevant equations.	(10)
