



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**U.G. DEGREE EXAMINATION – ALLIED**

**THIRD SEMESTER – NOVEMBER 2022**

**UCH 3401 – APPLIED CHEMISTRY FOR PHYSICS**

Date: 01-12-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**PART - A**

**Answer ALL questions.**

**(10 × 2 = 20 Marks)**

1. State Meissner effect.
2. Comment on the frequency doubling phenomenon in non-linear optics.
3. Cite the applications of TGA.
4. What is a first derivative curve in DTG?
5. Define degrees of freedom in a system.
6. Cite the applications of phase rule.
7. Define corrosion.
8. Mention the chemical formula for rust.
9. Draw the Haworth structure of glucose.
10. List the essential fatty acids.

**PART-B**

**Answer any EIGHT questions.**

**(8 × 5 = 40 Marks)**

11. Distinguish type-I and II superconductors.
12. Illustrate cholesteric and columnar liquid crystals.
13. Explain the DTG analysis of copper sulphate pentahydrate.
14. Discuss the factors affecting thermogram.
15. Derive the phase rule for a heterogeneous system.
16. Sketch and explain the phase diagram of lead-silver system.
17. Write a short note on corrosion inhibitors.
18. Explain the electrochemical corrosion of iron.
19. Illustrate the Benedict's test for carbohydrate.
20. Explain the structure of starch.
21. Illustrate smectic and nematic liquid crystals.
22. Describe the galvanic corrosion and its prevention.

**PAR-C**

*Answer any FOUR questions.*

**(4 × 10 = 40 marks)**

23. State Josephson effect and illustrate the BCS theory.
24. a. Describe the thermogravimetric analysis of calcium oxalate monohydrate and interpret the TGA curve obtained in the analysis.  
b. Draw the block diagram and explain the instrumentation of thermogravimetric analysis. (5+5)
25. Sketch and explain the phase diagram of water system.
26. a. Explain the cathodic and anodic protection for prevention of corrosion.  
b. What are the various types of corrosion? (8+2)
27. a. Illustrate Molisch's test for carbohydrate.  
b. Explain the structure of sucrose. (5+5)
28. Explain the following terms. (3+2+3+2)  
(i) Iodine number    (ii) Acid number    (iii) RM value    (iv) Saponification value.

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