



Date: 03-05-2025

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A

Answer ANY FOUR of the following

(4 x 10 = 40)

1. Explain the classification of liquid crystals with suitable examples.
2. Sketch and explain the DTG curve of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
3. Draw and explain the phase diagram of sulphur system.
4. Discuss the galvanic and electrochemical corrosion with an example.
5. Explain the classifications of carbohydrates with examples.
6. Distinguish type-I and type-II superconductors.
7. Analyze and Interpret the DTA curves of calcium oxalate monohydrate.
8. Sketch and explain the phase diagram of lead-silver system.

SECTION B

Answer ANY THREE of the following

(3 x 20 = 60)

9. a) Explain the BCS theory of superconductivity. (10)
b) Write a short note on the following (10)
 - i) Optical mixing
 - ii) Josephson effect
10. a) Discuss the factors affecting thermogram. (10)
b) Explain briefly the instrumentation of DTA. (10)
11. a) Sketch and explain the phase diagram of water system. (10)
b) Derive the Gibb's phase rule for a heterogeneous system. (10)
12. a) Discuss the anodic and cathodic protections in corrosion. (10)
b) Describe the following. (10)
 - i) Organic coatings
 - ii) Corrosion inhibitors
13. a) Explain any two tests to identify the presence of carbohydrates. (10)
b) Describe the following. (10)
 - i) Isoelectric point
 - ii) Essential amino acids
14. a) Write a note on liquid metal and direct corrosion with examples. (10)
b) Explain the following terms. (10)
 - i) Iodine number
 - ii) Acid number
 - iii) RM value
 - iv) Saponification value
