

Reg No.: _____



Jyothi Engineering College(Autonomous)
B. Tech Degree S1 (S) Examination, June 2026 (2025 Scheme)
25CHT101 - CHEMISTRY FOR INFORMATION SCIENCE AND ELECTRICAL SCIENCE



Total Mark: 60

PART A

(Answer All Questions. Each question carries 3 marks)

1. Explain why full charging is not advisable for a lithium-ion battery. CO1 (3)
2. What do you mean by a reference electrode? Mention any two. CO1 (3)
3. What is spintronics? Give any two examples of spintronic materials. CO2 (3)
4. Define nanomaterials. Give two examples and mention one unique property exhibited at the nanoscale. CO2 (3)
5. Why do electronic transitions occur in the UV-visible region, while vibrational transitions occur in the infrared region? CO3 (3)
6. What are the electronic transitions present in a) Phenol b) Benzene? CO3 (3)
7. Discuss the chemistry behind ozone depletion. CO5 (3)
8. Explain the three major aspects of sustainable development. CO5 (3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module - 1

9. a) Describe the mechanism and applications of electroplating of copper. CO1 (5)
- b) Explain the electrochemical mechanism of corrosion of iron in acidic medium. CO1 (4)

OR

10. Describe the construction and working of an H₂-O₂ fuel cell with a neat labelled diagram. CO1 (9)

Module - 2

11. a) Explain in detail the conduction mechanism in conducting polymers (p-doping and n-doping). CO2 (5)
- b) Explain the applications of nanomaterials. CO2 (4)

OR

12. a) Explain the synthesis and properties of Polypyrrole. CO2 (5)
- b) Discuss how the properties of materials change when they reach the nanoscale. CO2 (4)

Module - 3

13. a) Explain the applications of IR spectroscopy. CO3 (5)

b) Electronic transitions of a molecule are always accompanied by vibrational and rotational transitions. Explain with the help of a graph. CO3 (4)

OR

14. a) Define electromagnetic spectrum. How does the wavelength of electromagnetic radiation relate to the energy of molecular transitions? CO3 (5)

b) A 40 ppm standard solution of Fe^{3+} after developing colour with ammonium thiocyanate shows a transmittance of 0.3 at 620 nm while an unknown solution of Fe^{3+} after developing colour with the same amount of ammonium thiocyanate, gives a transmittance of 0.5. Find the concentration of the unknown Fe^{3+} solution. CO3 (4)

Module - 4

15. What is e-waste and what are the methods used for its disposal? CO4 (9)

OR

16. What is meant by water disinfection? Explain the various methods used for disinfecting water. CO4 (9)
