

8/5/26

Reg No.: \_\_\_\_\_



**Jyothi Engineering College(Autonomous)**  
B. Tech Degree S2 (R) Examination, May 2026(2025 Scheme)

**25CHT101 - CHEMISTRY FOR INFORMATION SCIENCE AND ELECTRICAL SCIENCE**



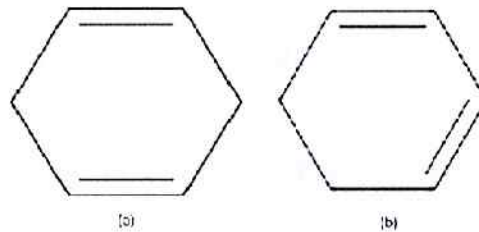
Total Mark: 60

Total Time: 2hrs 30 min  
CO MARK

**PART A**

(Answer All Questions. Each question carries 3 marks)

1. Sketch Calomel electrode and write down the cell representation. CO1 (3)
2. Mention any three advantages of using lithium-ion batteries. CO1 (3)
3. Give the structure of Novolac and Bakelite. CO2 (3)
4. Mention any three differences between bulk materials and nanomaterials. CO2 (3)
5. Identify which compound has the highest absorption maximum and give reason for your answer. CO3 (3)



6. How will you apply IR spectroscopy to distinguish between o-hydroxy phenol and p-hydroxy phenol? CO3 (3)
7. Mention the steps involved in the extraction of metals from e-waste. CO5 (3)
8. Give any three alternative refrigerants that can be used instead of conventional refrigerants to reduce the greenhouse effect. CO5 (3)

**PART B**

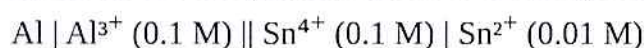
(Answer any one full question from each module, each question carries 9 marks)

**Module - 1**

9. a) Explain impressed current cathodic protection (ICCP) with a neat diagram. CO1 (5)
- b) What are primary reference electrodes and secondary reference electrodes? Give examples and write their cell representations. CO1 (4)

**OR**

10. a) Discuss the construction of the Standard Hydrogen Electrode (SHE) with a neat diagram and write its cell representation. CO1 (5)
- b) Calculate the cell potential at 25°C for the galvanic cell: CO1 (4)



Given:  $E^\circ(\text{Al}^{3+}/\text{Al}) = -1.66 \text{ V}$  and  $E^\circ(\text{Sn}^{4+}/\text{Sn}^{2+}) = +0.15 \text{ V}$

**Module - 2**

11. a) Explain in detail the sol–gel method of nanoparticle synthesis. CO2 (5)  
b) Differentiate between halogenated and non-halogenated fire-retardant polymers. CO2 (4)

**OR**

12. a) Describe the structure, bonding, and applications of Fullerenes. CO2 (5)  
b) List and explain any four important applications of carbon quantum dots (CQDs). CO2 (4)

**Module - 3**

13. a) What are the important components of a Scanning Electron Microscope (SEM), and what are their functions? CO3 (5)  
b) Calculate the force constant of the HF molecule if it shows IR absorption at  $4138 \text{ cm}^{-1}$ . CO3 (4)  
(Given: Atomic masses of hydrogen and fluorine are 1 u and 19 u, respectively.)

**OR**

14. a) What are the different types of energy possessed by a molecule? CO3 (5)  
b) Describe the components of Dielectric Thermal Analysis (DETA). CO3 (4)

**Module - 4**

15. a) Explain break point chlorination with a neat diagram. CO4 (5)  
b) Calculate the hardness of a 0.05 N  $\text{MgSO}_4$  solution and a 0.01 M  $\text{MgCl}_2$  solution in terms of equivalent  $\text{CaCO}_3$  concentration. CO4 (4)

**OR**

16. a) Explain the disadvantages of hard water in domestic and industrial use. CO4 (5)  
b) Give the methods to reduce the emission of carbon dioxide to the atmosphere. CO5 (4)

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