

Code No: 152AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year II Semester Examinations, January/February - 2024

CHEMISTRY(Common to CE, ME, ECE, EIE, MCT, MMT, AE, MIE, PTM, CSBS, CSE(AI&ML),
CSE(IOT), TTE, AI&DS, AI&ML)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A**(25 Marks)**

- 1.a) Define atomic and molecular orbitals. [2]
- b) Draw molecular orbital diagram of F_2 . [3]
- c) Define Temporary and Permanent hardness of water. [2]
- d) Write a note on Caustic embrittlement. [3]
- e) Write a short note on Galvanic cells. [2]
- f) Explain Electro less plating of Nickel. [3]
- g) What is Grignard's Reagent? Write the addition of Grignard's reagent on Carbonyl compounds. [2]
- h) Write the synthesis and application of Paracetamol. [3]
- i) Write the principle involved in NMR spectroscopy. [2]
- j) Explain magnetic resonance imaging. [3]

PART - B**(50 Marks)**

2. Discuss in detail the concept of LCAO. Draw the molecular orbital diagram of N_2 molecule and calculate bond order and predict its magnetic behavior. [10]
- OR**
3. Describe the crystal field theory for d-orbitals splitting in tetrahedral complexes of the transition metals with suitable examples. [10]
- 4.a) Describe the de mineralization of water by ion exchange method.
 - b) Discuss Reverse Osmosis Method. [5+5]
- OR**
- 5.a) What is the principle involved in internal treatment method and discuss in detail Calgon conditioning and Phosphate Conditioning.
 - b) Explain the process of Scale and Sludge formation in boilers. [5+5]
6. What is reference electrode? Discuss the construction and P^H calculation of unknown solution using calomel electrode. [10]

OR

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7.a) What is Oxidation Corrosion and how does it take place? Describe the mechanism of Oxidation Corrosion.

b) What happens when a Zn plate is fixed below a ship and why is it fixed? [5+5]

8.a) Explain addition of HBr to Propene with Markownikoffs and Anti Markownikoffs rule.

b) Discuss the mechanism of reduction in Carbonyl compounds using NaBH₄. [5+5]

OR

9. Describe the differential conformational isomers of n-butane with a neat diagram. Explain why staggered conformer is more stable than anti conformer. [10]

10. Discuss the different types of electronic transitions that occur in Organic molecules on absorption of U.V Spectra. [10]

OR

11. What are the Selection values in IR Spectroscopy? List out applications of IR Spectroscopy. [10]

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