

R18

Code No: 151AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, September - 2023

CHEMISTRY

(Common to EEE, CSE, IT, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(N), CSD)

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) What is doping? What is the energy gap in semiconductors? [2]
- b) P-type semiconductors having less conductivity than n-type semiconductors. Give reason. [3]
- c) Mention the impurities present in natural water. [2]
- d) Soft water is not demineralized whereas demineralized water is soft. Why? [3]
- e) Why do electrochemical cell stops working after sometime. [2]
- f) Rusting of iron is faster in saline water than in normal water. Give reason. [3]
- g) Write the structure and chemical formula for paracetamol. [2]
- h) Describe optical activity and optical isomerism. [3]
- i) What is high resolution spectrum in NMR spectroscopy. [2]
- j) What are the scales for chemical shift values in NMR? [3]

PART - B

(50 Marks)

- 2.a) Distinguish between bonding and anti-bonding molecular orbitals.
 - b) Explain Band theory of solids with a neat diagram. [5+5]
- OR**
- 3.a) Write a brief notes on π molecular orbitals of benzene.
 - b) Explain the crystal field splitting of transition metal ions in square planar geometry. [5+5]
- 4.a) A sample of water on analysis gives the following
 $MgCl_2=9.5$, $CaSO_4=3.4$ ppm, $Mg(HCO_3)_2 =7.3$ ppm, $MgSO_4= 6.0$ ppm. Calculate temporary and permanent hardness of the sample.
 - b) Explain how sterilisation of water is carried out by using chlorine and ozone. [5+5]
- OR**
- 5.a) Write a brief notes on potable water and its significance.
 - b) What are the important sources of water? [5+5]

