

Roll No.

3006

**B. Tech. 1st Semester (Common for All
Branches) Examination – December, 2022**

CHEMISTRY-I

Paper : BSC-CH-101-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) Differentiate between ionic and Vander Waals interaction. $6 \times 2.5 = 15$

(b) Define Hardness. How is it expressed ?

(c) What is an electromagnetic spectrum ?

- (d) Write the factors that govern the magnitude of crystal field splitting.
- (e) What do you mean by tautomerism ? Give example.
- (f) Briefly explain role of doping on band structure.

UNIT – I

2. (a) Explain the various parameters used in Schrodinger wave equation of Hydrogen. What are orthogonal and normalized wave functions ? 8

(b) What are factors on which electron affinity depends ? How does the electron affinity of the elements vary in a group and period ? 7

3. (a) Predict the bond order and magnetic properties of nitrogen molecule by M. O. energy level diagram. 8

(b) Discuss the physical properties of *d* and *f* block elements. 7

UNIT – II

4. (a) Explain addition, oxidation, substitution, reduction and cyclization reactions with suitable examples. 10
- (b) Describe R and S configuration. 5
5. (a) Give the synthesis of Asprin drug. 7
- (b) Draw various conformations of n-butane. Also compare their stability with reason. 8

UNIT – III

6. (a) What are critical constants ? Derive relationship between them. 7
- (b) Illustrate the zeolite process used for the softening of water with reaction involved. 8
7. (a) Define corrosion. What are factors affecting corrosion ? How is it prevented ? 7
- (b) What do you mean by demineralization and desalination ? Discuss in detail electrodialysis process desalination of sea water. 8

UNIT – IV

8. (a) What is meant by shielding and de-shielding of protons ? Illustrate your answer with suitable example. 8

(b) Explain the principle of U. V. spectroscopy. 7

9. (a) How will you distinguish ethyl alcohol and acetic acid by I. R. spectra ? 7

(b) Write brief notes on : $4 \times 2 = 8$

(i) Flame photometry

(ii) Magnetic resonance imaging