

Roll No.

3006

**B. Tech. 1st Semester
(Common for All Branches)
Examination – February, 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) Define optical activity with example.
- (b) What do you mean by electron affinity ?
- (c) What is general electronic configuration of *d* and *f* block elements ?
- (d) Pure soft water is not fit for drinking purpose, why ?

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P. T. O.

- (e) What are solvent effects in U.V. spectroscopy,?
- (f) Write Van der Waals equation for n moles. What is significance of Van der Waals constants 'a' and 'b'?
- $6 \times 2.5 = 15$

UNIT - I

2. (a) What is electronegativity? On what factors it depends? How does electronegativity of elements vary in a group and period. 8
- (b) What are main postulates of crystal field theory? 7
3. (a) Draw M. O. energy level diagram of CO. molecule and predict its bond order and magnetic properties. 8
- (b) Write note on the polarizability and oxidation states of s and p block elements. 7

UNIT - II

4. (a) Write the synthesis of Paracetamol drug. 7
- (b) Explain isomerism in transitional metal compounds with examples. 8
5. (a) Draw various conformations of n -propane and compare their stability. 5

(b) Write brief note on the following :

$2 \times 5 = 10$

- (i) Enantiomer
- (ii) Absolute Configuration
- (iii) Specific Rotation
- (iv) β -elimination Reaction
- (v) Diastereomers

UNIT - III

6. (a) What do you mean by hardness of water? Explain the E.D.T.A. methods in detail to remove the hardness of water. What is the role of ammonia buffer solution in this process? 7

(b) Explain the mechanism of the following : $4 \times 2 = 8$

- (i) Galvanic Corrosion
- (ii) Pitting Corrosion

7. (a) Discuss the ion exchange method of purifying the Water. Also explain their use and regeneration giving the reaction involved. 7

(b) Write note on the following : $4 \times 2 = 8$

- (i) Critical Constants
- (ii) Stability of chair form of cyclohexane over boat form.

UNIT - IV

8. (a) What is the basic principle of I. R. spectroscopy? 7
- (b) What is flame photometry? Describe its applications and drawbacks. 8
9. (a) Explain following terms: $2 \times 4 = 8$
- (i) Auxochrome and chromophore
 - (ii) Hyperchromic shift
 - (iii) Finger Print Region
 - (iv) Selection Rule
- (b) Write note on N.M.R. spectroscopy. 7

