

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 × 4 = 8
(i) Auto chrome and chromophore
(ii) Hyperchromic shift
(iii) Finger Print Region
(iv) Selection Rule
- (b) Write note on N.M.R. spectroscopy. 7

3006-2050-(P-4)(O-9)(22) (4)

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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- (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.
- (b) What are main postulates of crystal field theory ? 8
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

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- (b) Write brief note on the following : 2 x 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 EDTA 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 x 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 x 2 = 8
- (i) Critical Constants
- (ii) Stability of chair form of cyclohexane over boat form.

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