END SEMESTER EXAMINATION - DECEMBER 2024
CHEMISTRY - I SEMESTER BSC
24BSC15B - CHEMISTRY-I

Time: 3 Hours

Max. Marks: 80

Instruction: *Answer should be written completely in English.*

SECTION - A

Answer any **TEN** questions. Each question carries **TWO** marks.

(10X2=20)

1. Define the term 'precision'.
2. Explain the difference between absolute error and relative error.
3. What are the four characteristics of a primary standard?
4. Mention any two applications of noble gases.
5. Why are "f-block" elements called inner transition elements?
6. How does the atomic radii of transition metals change across a period and down a group?
7. Explain the Anti-Markovnikov rule with a suitable example.
8. What is inductive effect?
9. Explain elimination reaction with an example.
10. Write the mathematical expression of Maxwell-Boltzmann distribution law and deduce the terms.
11. What is inversion temperature?
12. State Nernst distribution law.

SECTION - B

Answer any **SIX** questions. Each question carries **TEN** marks.

(6X10=60)

13. a. Define errors. Mention the type of errors.   (5+5)
    b. Calculate the standard deviation of the following data. 22, 99, 102, 33, 57
14. a. Discuss the structure of diborane.   (5+5)
    b. What are transition elements? Explain the characteristics of transition elements with respect to the 1) Formation of colored compounds and 2) Magnetic properties.

15. a. Discuss briefly the Sachse-Mohr theory of strain less rings for cycloalkanes. (4+3+3)
    Draw the chair and boat forms of cyclohexane.
    b. What are dienes? Explain Diels-Alder reaction with an example.
    c. What are carbocations? Arrange the 1°, 2°, and 3° carbocations in increasing order of stability.

16. a. Define surface tension of a liquid and explain the effect of any two factors on it. (4+3+3)
    b. Mention any three factors which affects the viscosity of a liquid.
    c. What is the principle of fractional distillation.

17. a. What is chemical analysis? Discuss the classification of analytical methods. (5+5)
    b. Write any one method for the synthesis of XeO_3. Discuss the structure of XeO_3.

18. a. Discuss the conformations of ethane. (4+3+3)
    b. What is lanthanide contraction? Mention any two of its consequences.
    c. What are silicones? Mention any two applications.

19. a. Describe the mechanism of the oxidation reaction of alkenes with (4+3+3)
    osmium tetroxide (OsO_4)
    b. Explain the terms collision number, collision frequency and mean free path.
    c. Explain the Linde process for air liquefaction.

20. a. What are derived units? Define the terms: i) Percentage concentration and (4+3+3)
    ii) Parts per million.
    b. Calculate the molarity of a solution containing 10.6 g of Na_2CO_3 dissolved in
    100 cm^3 of a solution. [molecular mass of Na_2CO_3 =106].
    c. Calculate the critical pressure and critical volume. Given Vander Waals constant
    a = 0.3639 $Nm^4 mol^{-2}$, b = 4.27 x 10^{-5} $m^3 mol^{-1}$.