Name of Subject: chemical reaction engineering

Subject code: 17562

Semester: Fifth   **Course: CH**

Unite test -II

Chapter 4: Interpretation of Batch Reactor (24 marks)

3 marks question

1. The half-life period of a reaction of first order is 240 seconds. Calculate its rate constant in seconds and minutes.

2. Define zero order reaction. Derive its mathematical expression.

3. Differentiate between constant and variable volume reactions.

 4. Define fractional conversion of A (x_A) and fractional change in volume ε_A.

5. What is half-life? Give the mathematical expression and explain the terms.

6. Write the unit of rate constant for zero order, first order and second order reaction.

 4 marks question:

7. On doubling the concentration of reactant, the rate of reaction triples. Find the reaction order.

8. Explain the steps in the integral method of analysis of data.

9. Calculate the space time for the reaction A $\longrightarrow$ P, $(-r_A) = 0.0926$ (min) $^{-1}$ C_A, reaction takes place in PFR with 60% conversion of A.

10. For Zero order reaction, derive t $_{½}$ = C_{A0}/ 2k

11. Explain the steps in the differential method of analysis of data.

12. Derive the relation for constant volume irreversible second order reaction

    2A$\longrightarrow$P in terms of conversion using integral method of analysis

13. Draw the graph of Concentration Vs. time for first order reaction and auto catalytic reaction.

Write the value of slope also.

14. Show that for first order reaction the time required for 75% conversion is double the time required for 50% conversion.

15. Derive the kinetic equation in terms of concentration for constant volume unimolecular first order reaction.

Chapter5: Introduction to Reactor design(24marks)

3 marks question

 16. Define Space Time, Space Velocity and Holding Time.

17. Write the performance equation of PFR and explain the terms.

 4 marks question:

18. Compare MFR and PFR

19. State the advantages and disadvantages of batch reactor.

20. Show graphically how to find conversion, when MFR's of different sizes are connected in series,

21. What are the factors to be considered while designing a reactor?

 22. Derive the performance equation for a MFR.

23. How feed should be admitted when PFR's are connected in parallel?

24. In a batch reactor conversion of A is 70% in 13 minutes. Find the value of rate constant for first order reaction.

25. Give the classification of reactors?