# TE(Chemical)
# CHEMICAL REACTION ENGINEERING - I
# (2019 Pattern)

1. Explain optimum temperature progression for exothermic reversible reaction.
2. Explain Tank in series model.
3. Define instantaneous fractional yield and overall fractional yield in detail.
4. Derive the relation between conversion and temperature for an adiabatic reactor using the energy balance and explain how you determine the reactor size for adiabatic operation of a plug flow and a stirred tank reactor.
5. Explain energy balance equation for adiabatic operation graphically.
6. Write a short note on Micro and macro mixing of fluids and Early and late mixing.
7. Give quantitative treatment of product distribution and of rector size for parallel reaction.
8. Describe the qualitative discussion about product distribution for series reactions.
9. Explain in detail the effect of temperature on equilibrium conversion of reactant at constant pressure.
10. Explain effect of temperature, pressure and inert on equilibrium conversions (XAC) for exothermic and endothermic reactions.
11. Discuss Dispersion Model and tank in series model.
12. Explain in brief E and F curve and Segregation model
13. A reactor with a number of dividing baffles is used to run the reaction A → R with $-r_A = 0.05\ C_A$ mol/liter. min.

    A pulse tracer test gives the following output curve :

| Time min | 0 | lO | 20 | 30 | 40 | 50 | 60 | 70 |
|---|---|---|---|---|---|---|---|---|
| Concentration | 35 | 38 | 40 | 40 | 39 | 37 | 36 | 35 |

Calculate the variance of E curve.i

Calculate $X_A$ assuming Plug Flow