Assignment 2: Total marks: 20 Time: 45 min

1. Write the steps to select a definite mechanism and reaction rate model for a reaction. [3]
2. What do you mean by parameter estimation? [2]
3. Write briefly about catalyst deactivation indicating different reasons. [3]
4. What is equimolar counter diffusion? Define Knudsen diffusion. [1+2=3]
5. Define and explain mass transfer coefficient. How does the reaction rate depend on the size of the catalyst pellet and velocity of reactant through catalyst? Explain with proper diagram. [1+4=5]
6. Calculate the mass transfer coefficient of a solid catalytic reaction with nonporous catalyst. Considering single catalyst pellet of size= (3x last digit of your roll no) mm (if last digit is 0, then take it as 4). The reactant is present in dilute concentration and its velocity through the catalyst pellet is 2 cm/s. The liquid diffusivity is found to be 10^{-10} m^2/s and kinematic viscosity is $0.2x10^{-5}$ m^2/s. [4]