Quiz-1

BT209 (Bioreaction Engineering)

Date and time: February 21, 2022 (3:30 pm-4:20pm)

1. On doubling the concentration of reactant, the rate of reaction doubles. Find the reaction order. [2]
2. For the complex reaction with stoichiometry 2A + 3B = 2R + 5S and with second-order rate expression how are reaction rates (r_A, r_B, r_C and r_D) related? [1]
3. For the stoichiometry A + B → (products) find the reaction orders with respect to A and B. [2]

C_A	4	1	1
C_B	1	1	8
$-r_A$	2	1	4

4. Aqueous A reacts to form R (A →, R) and in the first minute in a batch reactor its concentration drops from C_{A0} = 2.5 mol/L to C_{Af} = 1.9 mol/L. Find the rate equation for the reaction if the kinetics are secondorder with respect to A. [2]
5. The activation energy of about 300 KJ/mol of a reaction A→R. How much faster is the decomposition at 650^0C than at 500^0C ? [1]
6. For the reaction A →R, second-order kinetics and C_{A0} = 10 mol/L, we get 50% conversion after 2 hour in a batch reactor. What will be the conversion and concentration of A after 3 hour if C_{A0} = 30 mol/L? [2]