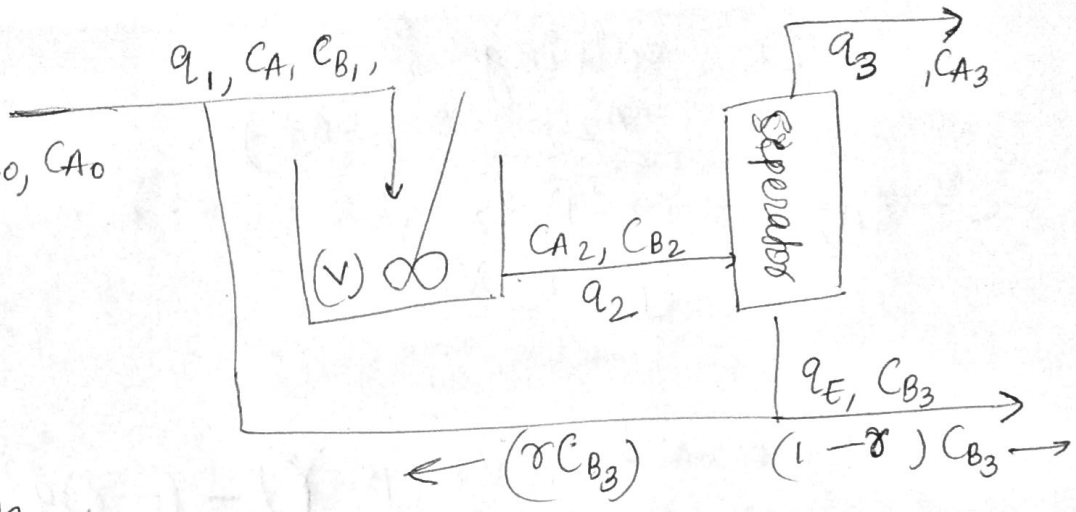
Q) 3



RXn

$$A + \beta B \longrightarrow \gamma\beta + \text{Pdts}$$

$$(\gamma > \beta)$$

unknowns, $C_{A_0}, C_{A_1}, C_{A_2}, C_{A_3}$ (conc^n of A)

$C_{B_1}, C_{B_2}, C_{B_3}, V, q_1, q_2, q_E, q_3, \gamma$ (conc^n of B) (flow rates) {recycler fraction}

given, $\longrightarrow$ $C_{A_1}, V, q_1, q_2, \gamma$

rate = $r_A = K C_A C_B$

BALANCE Equation

$$C_{A_1} q_1 - q_2 C_{A_2} - K C_{A_2} C_{B_2} V = 0 \longleftrightarrow (1)$$

$$q_2 B_2 = q_E C_{B_3} \longrightarrow (2)$$

$$(q_2 = q_E + q_3) \longrightarrow (3)$$

$$q_2 C_{A_2} = q_3 C_{A_3} \longrightarrow (4)$$

$$C_{B_1} q_1 - q_2 C_{B_2} - K C_{A_2} C_{B_2} \beta + K C_{A_2} B_2 \gamma = 0 \longrightarrow (5)$$

$$q_1 B_1 = \gamma q_2 C_{B_2} \longrightarrow (6)$$