

Systems Bioengineering 3

Homework 11

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1. We are given that:

$$\begin{aligned}G_T &= G + GX_n + GY_n \\G + nX &\rightleftharpoons GX_n \\G + nY &\rightleftharpoons GY_n\end{aligned}$$

(a)

$$\begin{aligned}GX^n &= GX_n \\ \frac{GX_n}{G} &= X^n\end{aligned}$$

(b)

$$\begin{aligned}GY^n &= GY_n \\ \frac{GY_n}{G} &= Y^n\end{aligned}$$

(c)

$$\begin{aligned}f &= \frac{GX_n + GY_n}{G_T} \\ &= \frac{GX_n + GY_n}{G + GX_n + GY_n} \\ &= \frac{X^G + Y^n G}{G + X^n G + Y^n G} \\ f &= \frac{X^n + Y^n}{1 + X^n + Y^n}\end{aligned}$$