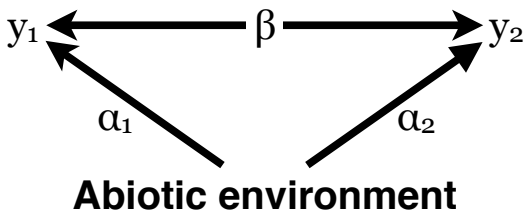
A.



$\alpha_1 = +1$
$\alpha_2 = +2$
$\beta = -1$

B.

$$\underline{\alpha_1 y_1} \quad \underline{\alpha_2 y_2} \quad \underline{\beta y_1 y_2}$$

$$P[\varnothing\,\varnothing] = e^{(+0 \quad +0 \quad +0)} / Z = e^{(0)} / Z$$

$$P[y_1\,\varnothing] = e^{(+1 \quad +0 \quad +0)} / Z = e^{(1)} / Z$$

$$P[\varnothing\,y_1] = e^{(+0 \quad +2 \quad +0)} / Z = e^{(2)} / Z$$

$$P[y_1 y_2] = e^{(+1 \quad +2 \quad -1)} / Z = e^{(2)} / Z$$

$$(e^0 + e^1 + e^2 + e^2) / Z = 1$$

C.

		Species 1: Absent	Species 1: Present
Species 2	Absent	5%	15%
	Present	40%	40%

D.

		Species 1: Absent	Species 1: Present
Species 2	Absent	3%	9%
	Present	24%	64%