

1. Which statement best describes the replicator dynamics equation?

- ☐ The replicator dynamics equation models the change in population proportions based on the difference between individual strategy payoffs and the average population payoff.
- ☐ The replicator dynamics equation describes how the total population size remains constant while individual strategy proportions evolve based on fitness levels.
- ☐ The replicator dynamics equation predicts that the proportion of each strategy remains constant regardless of fitness differences.
- ☐ The replicator dynamics equation ensures that all strategies eventually converge to an equal proportion in the population.

2. What is a stable population x for the replicator dynamics equation with $A = \begin{pmatrix} 5 & 3 \\ 1 & 4 \end{pmatrix}$

- ☐ $(5/7, 1/7)$
- ☐ $(1/2, 1/2)$
- ☐ $(1/5, 4/5)$
- ☐ $(1/10, 9/10)$

3. In the replicator-mutation dynamics equation which of the following matrices Q correspond to individuals of the 2nd type mutating to individuals of the 3rd type 20% of the time and individuals of the 3rd type mutating to individuals of the 1st type 75% of the time.

- ☐ $Q = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 4/5 & 1/5 \\ 0 & 3/4 & 1/4 \end{pmatrix}$
- ☐ $Q = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 4/5 & 1/5 & 0 \\ 3/4 & 0 & 0 & 1/4 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
- ☐ $Q = \begin{pmatrix} 1 & 3/4 & 0 \\ 1/5 & 0 & 4/5 \\ 0 & 0 & 1 \end{pmatrix}$
- ☐ $Q = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 4/5 & 1/5 \\ 0 & 3/4 & 0 & 1/4 \\ 0 & 0 & 0 & 1 \end{pmatrix}$