1. Based on the SIR model in Figure 2, why do the infected populations fluctuate over time?

A) The host population fluctuates on its own.

B) Each step in the SIR model takes time to proceed, and leads to a delay in the positive feedback.

\*C) Each step in the SIR model takes time to proceed, and leads to a delay in the negative feedback.

D) The fluctuation is an artifact of the step-by-step simulation process. If we use a continuous time simulation model, we would not see fluctuating populations.

2. Vectors of Myxoma virus transmission are

\*A) Mosquitoes, fleas, and black flies

B) Water

C) Rabbits

D) All of choices mentioned.

3. If an infectious disease is spread through host-host direct contact, which variable should be eliminated from the SIR model, as shown in Figure 2?

\*A) both “V” and “U”

B) either “U”or “V”

C) only “U”

D) nothing need to be changed

4. When K=20,000, and I1 = 1, what is the total host population size at equilibrium?

\*A) ~8900

B) ~ 18,000

C) ~20,000

D) ~ 12,500

5. When K=20,000, and I2 = 1, what is the total host population size at equilibrium?

A) ~8900

B) ~ 18,000

C) ~20,000

\*D) ~ 12,500

6. When K=20,000, and I3=1, what is the total host population size at equilibrium?

A) ~8900

\*B) ~ 18,000

C) ~20,000

D) ~ 12,500

7. When K=20,000, and I1= 1, I2=1, I3=1, What is the total host population size at equilibrium?

\*A) ~8900

B) ~ 18,000

C) ~20,000

D) ~ 12,500

8. When K=20,000, I1=1, I2=1, I3=1, which strain gives the largest % of infected individuals at equilibrium.

A) strain1

\*B) strain 2

C) strain 3

9. When K=20,000, I1=100, I2=1, and I3=100, which strain will dominate the host population at equilibrium?

A) strain1

\*B) strain 2

C) strain 3

10. When K=12,000, and I1= 1, what is the total host population size at equilibrium?

\*A) ~7300

B) ~ 8500

C) ~12,000

D) ~ 11,250

8. When K=12,000, and I2= 1, what is the total host population size at equilibrium?

A) ~7300

\*B) 8500

C) ~12,000

D) ~ 11,250

9. When K=12,000, and I3= 1, what is the total host population size at equilibrium?

A) ~7300

B) 8500

C) ~12,000

\*D) ~ 11,250

10. If we further reduce K, we can observed the epidemiological threshold. The range of the epidemiological threshold is

\*A) between 4900 and 5000.

B) between 5100 and 5200

C) between 4000 and 4100

D) between 3000 and 3100.

11. Based on “A plaque on both houses” and your simulations, which statement is WRONG?

A) Viruses with the lethal virulence tend to die with their host.

B) Viruses with the least virulence tend to have the weakest transmission rate.

C) The initial ratio of I1/I2 does not alter the outcome of the competition between strain 1 and strain 2.

\*D) There is a positive correlation between “infection kill rates” of viruses and the final host population size in equilibrium, when all other factors are the same.