# (B)

Dynamic Model

Regime 1:

$$d(prey(t)) = (1.98 \times prey(t) - 0.99 \times prey(t) \times predator(t))dt$$

$$d(predator(t)) = (-3.97 \times predator(t) + 0.99 \times prey(t) \times predator(t))dt$$

Regime 2:

$$d(prey(t)) = (1.98 \times prey(t) - 0.23 \times prey(t)^2 - 0.99 \times prey(t) \times predator(t))dt$$

$$d(predator(t)) = (4.94 \times predator(t) - 3.97 \times predator(t)^2 + 0.99 \times prey(t) \times predator(t))dt$$

Measurement Model

$$x = prey + \varepsilon_1$$

$$y = predator + \varepsilon_2$$