Algorithm: CGSL-ECM One-Time TTE Simulation (Gillespie + ODE)

Input: θ~ (from Model II's control parameters), *Q_base, y(·),*
(μ_I(s), σ_I(s)), t_start, x θ, sθ, V_cutoff, I_min
Output: TTE
Initialization: t ← θ, X ← sθ, x ← xθ
for *k* = 1 to 10000 **do**
1) Initialization: t ← 0, X ← s0, x ← x0
2) Main loop: while V_term(t) > V_cutoff do
a) Calculate t_day = (t_start + t) mod 24, and update gate γ = clip(v(t_day), 0, 1)
b) Construct the adaptive generation matrix (only gating {S1, S2} -> {S3, S4}, and calculate the diagonal terms)
c) Gillespie: sample time interval Δt ~ Exp(μ_I(X)), and sample the next state X_new
d) Sample the interval current I ~ max(1, μ_I(X), N(μ_I(X), σ_I^2(X)))
e) Use constant 1 to advance Model I and its ODE by Δt; if an event is triggered within the interval, return TTE
f) Update: t ← t + Δt, X ← X_new
3) End: return TTE = t
end