Abstract

In this thesis, we investigate the periodic character, invariant intervals,oscillation and global stability of all positive solutions of the equation :

$$x_{n+1} = \frac{\alpha + \beta x_n + \gamma x_{n-k}}{B x_n + C x_{n-k}}$$

where the parameters, α, β, γ, B, and C and the initial conditions are nonnegative. We give a detailed description of the semicyles of solutions, and determine conditions that the equilibrium points are globally asymptotically stable.

In particular, our monograph is a generalization to the rational difference equation that was investigated in [6].