1106-39-435 **Raegan Higgins** (raegan.higgins@ttu.edu), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79409, **Candace M Kent** (cmkent@vcu.edu), Department of Mathematics, Virginia Commonwealth University, Richmond, VA 23284, **Vlajko L Kocic*** (vkocic@xula.edu), Mathematics Department, Xavier University of Louisiana, New Orleans, LA 70125, and **Yevgeniy Kostrov** (ykostrov@xula.edu), Mathematics Department, Xavier University of Louisiana, New Orleans, LA 70125. *Dynamics of a nonlinear discontinuous difference equation.* Preliminary report.

In this paper we study the global asymptotic behavior, oscillation, and a periodicity of a discontinuous difference equation

$$x_{n+1} = F(x_n), \quad n = 0, 1, ..., \tag{1}$$

where $x_0 > 0$ and function F satisfies the following hypotheses:

($\mathbf{H}_1$)

$$F(x) = \begin{cases} f(x), & \text{if } x \in [0, a) \\ g(x), & \text{if } x \in [a, b) \\ h(x), & \text{if } x \in [b, \infty) \end{cases} \tag{2}$$

where $f \in C[[0, a], [0, \infty)]$, $g \in C[[a, b], (0, \infty)]$, and $h \in C[[b, \infty), (0, \infty)]$.

($\mathbf{H}_2$) functions f, g, and h are increasing on their respective domains.

($\mathbf{H}_3$) $f(x) < x$ for $x \in (0, a]$, $g(x) > x$ for $x \in [a, b]$, and $h(x) < x$ for $x \in [b, \infty)$

($\mathbf{H}_4$) $f(0) = 0$ and $\lim_{x\to\infty} h(x) = H > 0$.

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