South East Asian J. of Mathematics and Mathematical Sciences
Vol. 18, No. 2 (2022), pp. 27-38

DOI: 10.56827/SEAJMMS.2022.1802.3 **ISSN (Online): 2582-0850**

ISSN (Print): 0972-7752

NON-EXISTENCE OF ENTIRE SOLUTIONS OF NON-LINEAR GENERAL DIFFERENCE EQUATIONS

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(**Received:** *Aug. 19, 2021* **Accepted:** *Jun. 06, 2022* **Published:** *Aug. 30, 2022)*

Abstract: The main objective of this article is to investigate the solvability of a non-linear difference equation generated by general difference polynomial of a transcendental entire function of finite order.

Keywords and Phrases: Transcendental entire function, meromorphic function, small function, non-linear difference polynomial of a function, finite order, Nevanlinna theory.

2020 Mathematics Subject Classification: 30D35, 32H30.

1. Introduction, Notations, Definitions and Main Results

Many problems arising in a wide variety of application areas like physics, engineering, biology, ecology and economics give rise to mathematical models which includes complex difference equations. In studying difference equations in the complex plane $\mathbb{C}$, it is an interesting and quite difficult to prove the existence of transcendental entire solution of a given difference equation.

Recently, Nevanlinna's theory has been utilising by many researchers to study the properties of entire or meromorphic solutions of differential-difference equations in the complex plane.

In order to introduce our work, we assume that the reader is familiar with the fundamental results of Nevanlinna theory and its standard notations such as characteristic function $T(r, f)$, proximity function $m(r, f)$ and counting function for