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RESULTS ON UNIQUENESS OF PRODUCT OF CERTAIN TYPE OF SHIFT POLYNOMIALS

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Abstract. In this paper, using the concept of fixed point sharing with finite weight, we investigate the value distribution and uniqueness of product of certain type of difference polynomials. The results of the paper improve, extend and generalizes the results due to Renukadevi S. Dyavanal and Rajalaxmi V. Desai [19].

1. Introduction

In this article, we assume that the reader is familiar with the fundamental results and the standard notation of Nevanlinna value distribution theory (see [6],[12] and [13]). We denote by $S(r,f)$ any quantity satisfying $S(r,f)=o\{T(r,f)\}$ as $r\to\infty$, possibly outside of a set E with finite linear or logarithmic measure, not necessarily the same at each occurrence. We say that $a(z)$ is a small function of $f(z)$ if $T(r,a)=S(r,f)$. Let $f(z)$ and $g(z)$ be two non-constant meromorphic functions in the complex plane. We say that two meromorphic functions f and g share a IM (ignoring multiplicities) if $f(z)-a$ and $g(z)-a$ have the same zeros. If $f(z)-a$ and $g(z)-a$ have the same zeros with the same multiplicities, then we say that they share a CM (counting multiplicities).
The order and hyper order of meromorphic function f are defined by

$$\rho(f)=\limsup_{r\to\infty}\frac{logT(r,f)}{logr},\quad \rho_2(f)=\limsup_{r\to\infty}\frac{loglogT(r,f)}{logr}.$$

In addition, we need the following definitions.

Definition 1.[21] Let $a\in\mathbb{C}\cup\{\infty\}$. We denote by $N(r,a;f\mid=1)$ the counting function of simple a points of f. For a positive integer k we denote by $N(r,a;f\mid\leq k)$ the counting function of those a-points of f (counted with proper multiplicities) whose multiplicities are not greater than k. By $\overline{N}(r,a;f\mid\leq k)$ we denote the corresponding reduced counting

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