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A HYPERGEOMETRIC GENERATING FUNCTION INSPIRED BY THE WORK OF BEDIENT AND SHIVELY

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Abstract: In this article, a hypergeometric generating function with suitable convergence conditions in the form of Srivastava-Daoust triple hypergeometric function is derived by using series rearrangement technique. Some generating functions for Bedient's two polynomials and Shively pseudo-Laguerre polynomials are also obtained as special cases.

Keywords and Phrases: Hypergeometric functions; Series rearrangement technique; Pseudo-Laguerre polynomials; Bedient polynomials; Multiple series identity.

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1. Introduction and Preliminaries

Pochhammer symbol

In our investigations, we shall use the following standard notations:
$\mathbb{N} := \{1, 2, 3, \cdots\}; \mathbb{N}_0 := \mathbb{N} \bigcup \{0\}; \mathbb{Z}_0^- := \mathbb{Z}^- \bigcup \{0\} = \{0, -1, -2, -3, \cdots\}$.
The symbols $\mathbb{C}$, $\mathbb{R}$, $\mathbb{N}$, $\mathbb{Z}$, $\mathbb{R}^+$ and $\mathbb{R}^-$ denote the sets of complex numbers, real numbers, natural numbers, integers, positive and negative real numbers respectively. The Pochhammer symbol $(\alpha)_p$ $(\alpha, p \in \mathbb{C})$ [20, p.22, Eq.(1), p.32, Q.N.(8) and Q.N.(9), see also [29] p.23, Eq.(22) and Eq.(23)] is defined by

$$(\alpha)_p := \frac{\Gamma(\alpha + p)}{\Gamma(\alpha)} =$$