

**CERTAIN GENERATING RELATIONS ASSOCIATED WITH THE
FAMILY OF BESSEL FUNCTIONS AND MULTIPLE
HYPERGEOMETRIC FUNCTIONS**

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Abstract: In this paper, we obtain Laurent and Maclaurin types of hypergeometric generating relations for certain mixed special functions related to the Bessel functions using series rearrangement technique. Further some generating functions for Appell's functions, Lauricella's functions and multiple hypergeometric functions of Kampé de Fériet, are also given.

Keywords and Phrases: Appell functions, Bessel functions, Generating relations, Kampé de Fériet's multiple hypergeometric functions, Lauricella functions.

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1. Introduction and Preliminaries

The analytical and numerical study of generalized Bessel functions has revealed their interesting properties, which in some sense can be regarded as an extension of the properties of Bessel functions to a two-dimensional domain. In this connection, the relevance of generalized Bessel function and their multi-variable extension in mathematical physics have been emphasized, since they provide analytical solutions to partial differential equations such as the multi-dimensional diffusion equation, the Schrödinger and Klein-Gordon equations. The algebraic structure underlying generalized Bessel functions can be recognized in full analogy with Bessel functions,