CERTAIN UNIFIED INTEGRALS INVOLVING A PRODUCT OF THE FOUR-PARAMETER BESSEL FUNCTION AND JACOBI POLYNOMIAL

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Abstract: The present paper is devoted to derive a generalized Oberhettinger-type integral formula. The derived form of an integral involving the product of the four-parameter Bessel function and Jacobi polynomial. The outcomes are expressed in terms of the Kampé de Fériet and Srivastava and Daoust functions. Also, four Corollaries of the both Theorems are derived in terms of the Kampé de Fériet and Srivastava and Daoust functions. Some of the significant particular cases are also determined. Furthermore, we drive an interesting relationship between Kampé de Fériet and Srivastava and Daoust functions.

Keywords and Phrases: Bessel function, Hypergeometric function, Srivastava and Daoust function.

2020 Mathematics Subject Classification: 33C10, 33C20, 33C65.

1. Introduction

The Bessel function frequently appears in a wide variety of problems pertaining to applied Sciences. Daniel Bernoulli's analysis of the oscillations of a uniform heavy flexible chain is the first application of the Bessel function in the physical problems [9]. Bessel function and modified Bessel function play an important role in the analysis of optical transmission and microwave in waveguides [11, 19] including fiber and coaxial. Additionally, the Bessel function can be seen inverse problem