J. of Ramanujan Society of Math. and Math. Sc. **ISSN : 2319-1023**
Vol.3, No.1 (2014), pp. 01-10

Hypergeometric Transformations Involving Terminating Clausen's Series Using Beta Integral Technique

M.I. Qureshi, *Sulakshana Bajaj and *Yasmeen
Department of Applied Sciences and Humanities,
Faculty of Engineering and Technology, Jamia Millia Islamia (A Central University)
New Delhi - 110025, India
E-mail: miqureshi_delhi@yahoo.co.in

*Department of Mathematics,
Govt. College, Kota, University of Kota (Rajasthan) 324001, India
E-mail: sulakshana80@ymail.com

Abstract: The main object of this paper is to obtain the correct form of two erroneous integrals of Erdélyi et al. [*Tables of Integral Transforms*, Vol.II, p.284(16.4.1 and 16.4.3)]. Five hypergeometric transformations of the terminating Clausen's series ${}_3F_2$ are also obtained.

Keywords and Phrases: Jacobi Polynomials, Clausen's series, Saalschütz' theorem, Gauss's theorem.

2010 MSC(AMS) Primary: 33C05, 33C20; Secondary: 33C45.

1 Introduction and Preliminaries

Throughout in the present paper, we use the following standard notations:
$\mathbb{N} := \{1, 2, 3, \ldots\}$, $\mathbb{N}_0 := \{0, 1, 2, 3, \ldots\} = \mathbb{N} \cup \{0\}$ and $\mathbb{Z}^- := \{-1, -2, -3, \ldots\} = \mathbb{Z}_0^- \backslash \{0\}$.

Here, as usual, $\mathbb{Z}$ denotes the set of integers, $\mathbb{R}$ denotes the set of real numbers, $\mathbb{R}^+$ denotes the set of positive real numbers and $\mathbb{C}$ denotes the set of complex numbers.

The Pochhammer symbol (or the shifted factorial) $(\lambda)_\nu$ $(\lambda, \nu \in \mathbb{C})$ is defined, in terms of the familiar Gamma function, by

$$(\lambda)_\nu := \frac{\Gamma(\lambda + \nu)}{\Gamma(\lambda)} = \begin{cases} 1 & (\nu = 0; \lambda \in \mathbb{C} \backslash \{0\}) \\ \lambda(\lambda+1)\ldots(\lambda+n-1) & (\nu = n \in \mathbb{N}; \lambda \in \mathbb{C}) \end{cases} \tag{1.1}$$

it being understood *conventionally* that $(0)_0 = 1$ and assumed tacitly that the Gamma quotient exists.

In the Gaussian hypergeometric series ${}_2F_1(a, b; c; z)$ there are two numerator parameters a, b and one denominator parameter c. A natural generalization of this series is accomplished by introducing any arbitrary number of numerator and denominator parameters. The resulting series