South East Asian J. of Math. & Math. Sci. **ISSN : 0972-7752**
Vol.11, No.1 2015, pp. 97-106

Some Extensions of Multiple Gaussian Hypergeometric Series

Renu Chugh, Prakriti Rai* and Smita Sharma**
Department of Mathematics, Maharishi Dayanand University, Rohtak
E-mail: chugh.r1@gmail.com
*Department of Mathematics, Amity University, Noida
E-mail: prai@amity.edu
**Department of Mathematics, KIIT Gurgaon, Gurgaon
E-mail: smitasood10@gmail.com

Abstract: Some investigation of general multiple series identities which extend and generalize the theorems of Bailey [*1*] and Pathan [*2*] is done. Its special cases yield various new transformations and reduction formulae involving quadruple hypergeometric function $F_p^{(4)}$, and Srivastava's quadruple hypergeometric functions $F^{(4)}$ and triple hypergeometric function $F^{(3)}$.
Keywords and phrases: Dixon's Theorem, Multiple Gaussian Hypergeometric Functions.
2000 A.M.S. subject classification: Primary 33C45, 33C55, 33C64, 33C65, 33C70, 33C99.

1. Introduction

Let (a_A) denote the sequences of A parameters given by $a_1, a_2, ..., a_A$ and $[(a_A)]_n$ denote the product of A Pochhamer symbols defined by

$$(b)_n = \frac{\Gamma(b+n)}{\Gamma(b)} = \begin{cases} 1, & \text{if } n = 0 \\ b(b+1)...(b+n-1), & \text{if } \quad n = 1, 2, 3, ... \end{cases}$$

In 1969, Srivastava and Daoust ([7, page 454], see also [8, page 37 (21,22)]) gave the following multivariable hypergeometric function,

$$F_{D:E^{(1)};...;E^{(n)}}^{A:B^{(1)};...;B^{(n)}} \left[\begin{matrix} [(a_A) : \theta^{(1)}, ..., \theta^{(n)}] : [b_{B^{(1)}}^{(1)} : \Phi^{(1)}]; ...; [b_{B^{(n)}}^{(n)} : \Phi^{(n)}] z_1, ..., z_n \\ [(d_D) : \Psi^{(1)}, ..., \Psi^{(n)}] : [e_{E^{(1)}}^{(1)} : \delta^{(1)}]; ...[e_{E^{(n)}}^{(n)} : \delta^{(n)}] \end{matrix} \right]$$

$$= \sum_{m_1,...,m_n}^{\infty} \Xi(m_1, ..., m_n) \frac{z_1^{m_1}}{(m_1)!} ... \frac{z_n^{m_n}}{(m_n)!}$$